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67th ANNUAL MEETING

UNIVERSITY OF CENTRAL FLORIDA

Orlando, Florida
MARCH 21-22, 2003

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2003 PROGRAM ISSUE

THE SIXTY-SEVENTH ANNUAL MEETING OF THE
FLORIDA ACADEMY OF SCIENCES
in conjunction with the
Florida Junior Academy of Science
and the Science Talent Search

University of Central Florida
Orlando
March 21-22, 2003

Featuring a Special Session:

Science and the Lake: Baseline Environmental Studies of Lake Okeechobee and Its Watershed

Medallist Address

"*Lessons from the Sea*"
by Dr. John H. Trefry

Gale Plenary Lecture

"*Dead Mars, Dying Earth: Planetary Crisis and Recovery*"
by Dr. John E. Brandenburg

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University of Central Florida

Office of the President

January 10, 2003

To the Members of the Florida Academy of Sciences:

Welcome to the University of Central Florida. We are so pleased that you have chosen to hold your 67th annual meeting on our campus.

The tenth oldest of the forty-four state and regional academies of science that comprise the National Association of Academies of Science, the Florida Academy is the most comprehensive scientific academy in the state and serves as a forum for the research of students, faculty members, and scientists from government agencies and industry.

We are proud to have a large number of faculty members at UCF who are members of the FAS, including past presidents Drs. Al Miller and Leslie Sue Lieberman and in-coming president Dr. Cherie Geiger.

We look forward to hosting the Florida Academy of Sciences, and I extend my best wishes to you for an exciting and rewarding meeting.

Cordially yours,

John C. Hitt

John C. Hitt
President

P.O. Box 160002 • Orlando, FL 32816-0002 • (407) 823-1823 • FAX (407) 823-2264 • jhitt@mail.ucf.edu

FAS PRESIDENT'S WELCOME

It is indeed a pleasure to welcome all participants to the Sixty-seventh Annual Meeting of the Florida Academy of Sciences. This year's meeting is hosted by the University of Central Florida. We are very grateful to the UCF administration, staff, faculty and participating students for their preparations. We look forward to a profitable and enjoyable meeting.

The Florida Academy of Sciences has the distinction of serving as the only scientific society in the State with the mission of embracing all the disciplines in the field. This emphasis enables us to bring together representatives from many branches of science to concentrate on a single issue of statewide importance. This year we are pleased to present a Special Session titled "*Science and the Lake: Baseline Environmental Studies of Lake Okeechobee and Its Watershed.*"

Barry Wharton

MEETING INFORMATION

The 67th Annual Meeting of the Florida Academy of Sciences will be held at the University of Central Florida in Orlando, Florida from March 21-22, 2003. Abstracts on all aspects of science are solicited for general sessions in all Sections of the Academy (list of Sections on back of front page). One special Sessions is planned, and additional ones are encouraged. Any person or Section interested in organizing a Special Session should contact the appropriate Section Chair or the Program Chair for further information.

LOCATION

UCF's main campus is located 13 miles east of downtown Orlando at 4000 Central Florida Blvd. Below are several routes for easy access to the campus. From I-4 West (Tampa): Exit 72 (old exit 28) onto east 528 (Toll Road). Go past Orlando International Airport to 417 north. Take 417 north (Toll Road) to exit 37 on University Blvd. Exit east onto University Blvd. to UCF. From I-4 East (Daytona Beach): Exit 94 (old exit 49) onto FL 434 east. Go through Longwood, Winter Springs, and Oviedo on FL 434 to UCF. From South on Turnpike: Exit 254 (Orlando South - 441). Take first right onto east 528 (Toll Road). Go east past Orlando International Airport to 417. Take 417 north (Toll Road) to exit 37 -University Blvd. Exit east onto University Blvd. to UCF. From North on Turnpike: Exit 267 onto east 408 (Toll Road). Go east through Orlando to merge with 417. Take 417 north to exit 37 - University Blvd. Exit east onto University Blvd. to UCF.

UCF was originally established by the state legislature in June of 1963 under the name of Florida Technology University as a state university

serving the counties of east central Florida (Flagler, Orange, Seminole, Lake, Brevard, Volusia, Osceola, Indian River, and St. Lucie). Classes began in October 1968 with an initial enrollment of 1, 948 students. In 1978, the school's name was changed to the University of Central Florida, and by the fall of 2001, it boasted a total of 36, 013 students, making it one of the largest of the 11 public universities in the state. The former technological university now offers 76 Baccalaureate, 62 Masters's, 20 Doctoral, and 3 Specialist Programs. UCF is a co-educational institution and houses a diverse community on several campuses. A total of 1,228 full and part-time faculty, along with 1,159 executive, administrative and support staff serve the student community. The main campus comprises 102 buildings on 1,415 acres just 13 miles east of downtown Orlando. The other campuses are: UCF downtown Orlando, Central Florida Research Park in Orlando, UCF Professional Development Center in Orlando, the UCF Higher Education Center at Daytona Beach, the Clark Maxwell Jr. Lifelong Learning Center at Cocoa, and the Florida Solar Energy Center in Cocoa. For more information on UCF please visit the university website at www.ucf.edu.

REGISTRATION

ALL PARTICIPANTS MUST REGISTER but you need not be a member in order to present a paper or poster. Participants are urged to register early using the online form. Academy members will receive a Program Preview by mail, as will non-members who register before February 1, 2002. The Program Issue of the Florida Scientist (Supplement 1 to Volume 66) will be available at the Registration Desk, which will be open on Thursday afternoon, March 20, 3:00-5:00 p.m., Friday, March 21, 7:30 a.m.-4:00 p.m., and Saturday March 22, beginning at 7:30 a.m.

LODGING

No reservations can be made through the Academy. The following hotels are nearby and may have so-called "*UCF rates*" if you identify yourself with the FAS meeting. Prices listed are approximate and may show seasonal variation. Early reservations are a must at this time of year.

- Radisson University Hotel Orlando. This hotel will be the main conference hotel. Ask for the FAS room block. Located two miles south of UCF. Free transportation to UCF. 1724 Alafaya Trail, Orlando, FL, 32826, www.radisson.com/orlandofl_university, 407-658-9008-UCF Rate $79.00
- Holiday Inn Select Oralndo East-UCF Area. Located ½ mile from UCF. www.hiecf.com, 12125 High Tech Avenue, Orlando, FL 32817, 407-275-9000-UCF Rate $75.00

- Hilton Garden Inn Orlando East/UCF. Located 1 ½ miles south of UCF. www.orlandoeastucf.gardeninn.com, 1959 N. Alafaya Trail, Orlando, FL 32826, 407-992-5000-UCF Rate $85.00
- Marriott Residence Inn Orlando East@UCF. Located ½ mile from UCF. www.residenceinn.com, 11651 University Blvd., Orlando, FL., 32817-UCF Rates $99.00/studio or 1 bedroom, $149.00/2 bedroom
- Courtyard at UCF Orlando East. Located 1 mile from UCF. www.courtyard.com, 12000 Collegiate Way, Orlando, FL, 32817 407-277-7676

MEALS

The Academy Banquet will be held on Friday evening, March 21, in the Cape Florida Ballroom of the Student Union building. Dinner commences at 7 p.m. and will include a choice of Beef Wellington, Chicken Piccatta, Grilled Swordfish, or Vegetable Strudel. Pre-registration for the banquet is recommended as only a limited number of tickets will be available on the day of registration. Various eating facilities will be open on Friday in the Student Union (Subway, Sbarro's, Baja Burrito, Wackoodees Grill and Bar, etc.), and a bag lunch will be served during the Plenary Session. There are also numerous restaurants near UCF on University Blvd. Further information will be available at the Registration desk.

BUSINESS MEETING & PLENARY SESSION

The Gale Plenary Address will be given on Friday, March 21, at 1:00 p.m. immediately following the 12:30 p.m. FAS Annual Business Meeting. Dr. John E. Brandenburg, a Research Scientist with the Florida Space Institute and a member of the UCF College of Engineering and Computer Science faculty, will present a lecture titled "*Dead Mars, Dying Earth: Planetary Crisis and Recovery.*"

MEDALLIST PRESENTATION

Dr. John H. Trefry, the 2002 Academy Medallist, will present the Annual Medallist Address titled "*Lessons from the Sea*" immediately following the Banquet Friday evening. Dr. Trefry is Professor of Oceanography and Environmental Science in the Department of Marine and Environmental Systems at the Florida Institute of Technology. He received his Ph.D. degree from Texas A &M University, and his research focuses on the concentrations and cycling of trace metals in oceans, estuaries, and rivers. Dr. Trefry was a member of the pioneering scientific team that photographed and sampled active hydrothermal vents on the Mid-Atlantic Ridge in 1985.

FIELD TRIPS

Special field trips being run in connection with the Annual Meeting will be announced in the Program Preview, to be mailed in February. For information concerning local attractions check at the Registration Desk.

LOCAL ARRANGEMENTS

The Local Arrangements Co-Chairs for the Annual Meeting are Dr. I. Jack Stout and Dr. Leslie Lieberman of the University of Central Florida (please see contact information in the section chair list on the inside front cover of this program). They may be consulted for any special meeting needs.

SPECIAL SESSION

Science and the Lake: Baseline Environmental Studies of Lake Okeechobee and Its Watershed. This special session has been planned by Mr. Barry R. Wharton, President of the Florida Academy of Sciences; Dr. Charles Hanlon, South Florida Water Management District, and Mr. David J. Karlen, Co-Chair of the Biological Sciences Section. The Special Session begins at 2:00 p.m. on Friday, 21 March 2003 with Dr. Hanlon presiding.

FLORIDA JR. ACADEMY OF SCIENCE ANNUAL COMPETITION

The Junior Academy will meet with Florida Academy of Sciences this year. As the student division of FAS, the Florida Junior Academy of Science provides opportunities that encourage middle and high school students in science by allowing them to compete, share, and network with other students and adults having common interests. The focus of this "common bond" among participants is their research activities. The Florida Junior Academy of Science is seeking volunteers to assist in judging and to act as section moderators at its meeting, to be held on Saturday, March 22nd. The Junior Academy is also seeking individuals in early February of 2003 to evaluate research papers submitted for this meeting. Persons interested in participating in this rewarding experience should contact the FJAS Coordinator: Ms. Patricia Zalo, 2812 26th Avenue Drive W., Bradenton, FL 34205-3707, telephone 941-756-4156, email pzalo@yahoo.com

COMMERCIAL AND INSTITUTIONAL EXHIBITS

Space is available on a first come-first served basis for a fee of $75.00. Exhibits by research institutions or organizations offering programs of an informational nature may be given free space. Parties interested in fee or free spaces should contact the Local Arrangements Chair for details.

NOMINATIONS FOR THE FLORIDA ACADEMY OF SCIENCES MEDAL RECIPIENT

The Florida Academy of Sciences encourages its members to submit formal nominations for candidates to be considered for the 2003 Medallist Award. Nomination Procedure: complete the Nomination Form and mail to Dr. Maribeth Durst, Chair, Medallist Selection Committee, Saint Leo University, Saint Leo, FL 33574 (campus email address: maribeth.durst@saintleo.edu). Nomination forms must arrive no later than October 31, 2002. Criteria: The Florida Academy of Sciences Medal is presented each year at the Annual Meeting to a resident of the State of Florida, who has contributed in an outstanding manner to the promotion of scientific research, to the stimulation of interest in the sciences, or to the diffusion of scientific knowledge. The candidate need not be a Ph.D. He or she may be a research scientist, a philanthropist, an educator, a journalist, a science fair coordinator, a member of industry, government, or other organization, who has met the above criteria.

STUDENT AWARDS

Students presenting papers at the Annual Meeting of the Academy, and who are registered for the Meeting, may be considered for a number of awards. Details are presented below. Students wishing to be considered for one or more of these awards should indicate their interest on the Abstract Submittal Form. Dr. Theodore Rochow is the FAS Awards Chair, and he can be reached at: SW Florida Water Management District, 2379 Broad Street, Brokksville, FL 34604-6899, 352-796-7211, email address: ted.rochow@swfwmd.state.fl.us

- ***Outstanding Student Papers Award*** - This award is presented by any of the Academy Sections to graduate and/or undergraduate students.
- ***American Association for the Advancement of Science Award*** - This award is presented to one male and one female undergraduate student annually and is a one-year membership in AAAS including the journal Science.
- ***Sigma Xi Awards*** - The first award, presented by the University of Florida chapter of Sigma Xi, is for $50 and a certificate. This award is presented to graduate students only. The second award is presented by Florida Institute of Technology for the best paper by a Florida Tech student. The award is for $50 and $100 for undergraduate and graduate students respectively.
- ***William W. Behrens, Jr./Florida Institute of Oceanography Award*** - This $750 prize is awarded by the Florida Institute of Oceanography to a graduate student for the best paper in any area of ocean or marine sciences. A written manuscript is required and must be submitted by

67TH ANNUAL MEETING: FLORIDA ACDEMY OF SCIENECES
21-22 MARCH 2003
PROGRAM ADDENDUM

1. Session Schedule Revisions (AGR, BIO, ENV, MED, PSS, TCH, and SOC):

Agricultural and Natural Resources (AGR):

Friday, March 21, 8:30 am – 12:00 pm (Key West Room 218A)

AGR-1 (8:30 a.m.) **Ecology and soil and plant analyses of wild hydrangea (*Hydrangea arborescens* L.) for the treatment and prevention of kidney stones.** R.S. TUBBS and R.N. GALLAHER.

AGR-2 (8:45 a.m.) **Phosphorus budget analysis for the northern Lake Okeechobee watershed, Florida.** J.G. HISCOCK, C.S. THOUROT, and J. ZHANG.

AGR-3 (9:00 a.m.) **Root growth interactions between *Muhlenbergia capillaris* L. and *Imperata cylindrica*.** L.H. DUEBERRY, O.U. ONOKPISE and J. NORCINI.

AGR-4 (9:15 a.m.) **Methyl bromide phase-out: economic implications for Florida tomato growers.** J. MCGUIRE and M.A. WADE.

AGR-5 (9:30 a.m.) **Strip-till management of sweet corn (Zea mays L.) following rye (*Secale cereale* L.).** R.N. GALLAHER.

AGR-6 (9:45 a.m.) **Chemical weed control for two varieties of cowpea (*Vigna unguiculata* L.).** D.C. YODER, R.N. GALLAHER, and G.E. MACDONALD.

AGR-7 (10:00 a.m.) **Cowpea (*Vigna unguiculata* L.) variety effects on the succeeding turnip (*Brassica rapa* L.) crop using three single-factor experimental designs.** K.A. SEAMAN, R.N. GALLAHER, K-H. WANG, and R. MCSORLEY.

AGR-8 (10:30 a.m.) **Turnip (*Brassica rapa* L.) and mustard (*Brassica juncea* L.) yields as impacted by plant population and nitrogen fertilizer.** B. BRACHO and R.N. GALLAHER.

AGR-9 (10:45 a.m.) **Long-term phosphorus retention in soils loaded with cow manure in the Lake Okeechobee watershed.** E.G. FLAIG, V.D. NAIR, and D.A.GRAETZ.

AGR-10 (11:00 a.m.) **Yield and disease ratings of nine peanut (*Arachis hypogaea* L.) varieties grown conventional versus no-till with a strip-till Planter.** J.L. MCKINNEY, R.N. GALLAHER, J.A. BALDWIN, and B. KEMERAIT.

AGR-11 (11:15 a.m.) **Results of monitoring programs to control phosphorus discharges in the Lake Okeechobee watershed.** J. ZHANG, B. WHALEN, G. RITTER, and E.J. ALBERS.

AGR-12 (11:30 a.m.) **Weed management, chemical use and environmental adaptation on Florida cattle operations.** M.A. WADE and T. M. MINTON.

AGR-13 (11:45 a.m.) **Soil physical and chemical properties in a twenty-year old Loblolly Pine plantation in North Florida.** L. A. WHILBY and O.U. ONOKPISE.

AGR-14 (12:00 p.m.) **Ground penetrating radar imaging and seepage characteristics of agricultural reservoirs, Southwest Florida.** C. BRYANT, S. KRUSE, and E. FLAIG.

Biological Sciences (BIO):

(*Room change only*)

Session B, Friday, March 21, 9:00 am – 12:00 noon (Cape Florida Room 316D)

Session C1-C2, Friday, March 22, 2:00 pm – 5 pm (Cape Florida Room 316D)

Environmental Chemistry & Chemical Sciences (ENV):

Session A, Friday, March 21, 8:00 am – Noon (Cedar Key Board Room 223)

ENV-1 (8:00 a.m.) **Development of new growth factors for petroleum degrading marine bacteria.** R. KINKADE, S. NASER, and O. PHANSTIEL.

ENV-2 (8:15 a.m.) **A study of the effects of mechanical alloying conditions on hydrogen interaction characteristics of mixtures of titanium, magnesium and nickel.** J. GILBERT, M. FRANJIC, M. HAMPTON, and L. GIANNUZZI.

ENV-3 (8:30 a.m.) **Preparation of 9,9-cyanoethyl-2,7-bis-diphenylamino-fluorene for application in two photon dye research.** K.D. BELFIELD, A. BRICE, and S. YAO.

ENV-4 (8:45 a.m.) **Preparation of a functionalized monomer for incorporation into a hydrogel filter.** K.D. BELFIELD, P. ARMSTRONG, S. YAO.

ENV-5 (9:00 a.m.) **Novel calamitic liquid crystals: synthesis and characterization.** M. QADDOURA and K. BELFIELD.

ENV-6 (9:15 a.m.) **Historical blunders and fraud in chemistry.** D.F. MARTIN and B.B. MARTIN.

ENV-7 (9:30 a.m.) **Manganese (II) oxide for hydrogen gas detection.** D. CAUCEGLIA, M.D. HAMPTON, and J.K. LOMNESS.

ENV-8 (9:45 a.m.) **Use of chemically modified silica reagents in the removal of copper(II), cadmium(II), nickel(II), silver(I), and lead(II) ions.** C.A. BOWE and D.F. MARTIN.

ENV-9 (10:15 a.m.) **Effect of spectral regions on the growth of duckweed, *Lemna minor*.** L. ANDERSON, C.A. BOWE, and D.F. MARTIN.

ENV-10 (10:30 a.m.) **Computer simulation of water simulation by reverse osmosis.** B. CORLAY, J. HAKY and A. ZILOUCHIAN.

ENV-11 (10:45 a.m.) **Phosphate and nitrate uptake and growth of duckweed, *Lemna minor*.** M. MCKENZIE, C. BOWE, D.P. SMITH, and D.F. MARTIN.

ENV-12 (11:00 a.m.) **Remediation of DNAPLS using emulsified zero-valent iron: Laboraotry and field results.** C.L. GEIGER, C.A. CLAUSEN, C.C. COON, K.B. BROOKS, C.A. HUNTLEY, L.B. FILIPEK, R. DEVOR, T.A. KRUG, S. O'HARA, D. MAJOR, and J. QUINN.

ENV-13 (11:15 a.m.) **Electrodeposition of manganese dioxide on gold coated quartz crystal microbalances for hydrogen sensing.** E.A. PEREZ, M. HAMPTON, M.L. SCHULZ, and A.F. SLATERBECK.

ENV-14 (11:30 a.m.) **Photocatalytic reduction of Fe(VI) in aqueous solutions.** Y. KRANSNOVA, V. SHARMA, C. WINKELMANN, and K. WINKELMANN.

ENV-15 (11:45 a.m.) **Use of *Lemna minor* species of duckweed in the removal of zinc (II), copper (II), and lead (II) Ions.** C.A. BOWE, D.P. SMITH, and D.F. MARTIN.

Session B, Friday, March 21, 2:00 pm – 5:00 pm (Cedar Key Board Room 223)

ENV-16 (2:15 p.m.) **Synthesis of acinetoferrin homologues.** R. GARDNER and O. PHANSTIEL IV.

ENV-17 (2:30 p.m.) **Effect of Ti-catalysts on hydrogen storage properties of $LiAlH_4$.** M. FRANJIC, J. GILBERT, M.D. HAMPTON, and D.K. SLATTERY.

ENV-18 (2:45 p.m.) **Use of chemically modified montmorillonite for the removal of copper (II), cadmium (II), nickel (II), silver (I), and lead (II) ions.** N. KRIKORIAN, C.A. BOWE, and D.F. MARTIN.

ENV-19 (3:00 p.m.) **Spectral properties and determination of singlet oxygen production by fluorene-based photosensitizers with potential application in two photon photodynamic cancer therapy.** K.D. BELFIELD and C.C. CORREDOR.

ENV-20 (3:15 p.m.) **Mechanism of action in photodynamic therapy (PDT).** K.D. BELFIELD, C. CORREDOR, and M. A. DESSOURCES.

ENV-21 (3:45 p.m.) **Synthesis of a new fluorene derivative for two-photon absorption.** K.D. BELFIELD, K. MILUM, and A.R. MORALES.

ENV-22 (4:00 p.m.) **High throughput structure determination (HTSD) to elucidate cancer progression mechanisms in functionally unclassified proteins.** S. OZYURT and T.L. SELBY.

ENV-23 (4:15 p.m.) **Designing cross reactive enzyme inhibitors to control junction pathway metabolism in the treatment of genetic disorders.** H.A. DAVIS and T.L. SELBY.

ENV-24 (4:30 p.m.) **Using genetic diversity to improve drug design through reverse structure activity relationships (rSAR).** T.L. SELBY.

Posters: Env./Chem., Friday, March 21, 8:00 am – 4 pm (Union Room 302)

POS-10 **Synthesis of nitrogen containing derivatives of podocarpic acid.** J.V. RUPPEL, K. HESTER II, R. FLEMMING, T. WRIGHT, G. CUNNINGHAM, and D.H. MILES.

POS-11 **A search for new anti-tuberculosis agents from synthetics and natural products.** K. HESTER II, J.V. RUPPEL, S. NASER, E. GOUN, G. CUNNINGHAM, and D.H. MILES.

POS-12 **A search for new drug leads for treatment of breast cancer.** T. WRIGHT, J.V. RUPPEL, K. HESTER II, E. GOUN, R. TARNUZZER, G. CUNNINGHAM, and D.H. MILES.

POS-13 **Dechlorination of polychlorinated biphenyls in solution by Pd/Fe bimetallic emulsions.** L.B. FILIPEK, C.C. COON, C.L. GEIGER, C.A. CLAUSEN, J. QUINN, and R. DEVOR.

Medical Sciences (MED):

(*Room change only*)

Saturday, March 22, 8:00 am – 12:15 pm (Cape Florida Room 316A/B)

Joint Meeting: Eng./Physics & Physics and Space Sciences (PSS):

Session A, Friday, March 21, 9:00 am – Noon (Sand Key Room 220)

PSS-1 (9:00 a.m.) **The fate of nitrogen in a bioreactor landfill.** N.D. BERGE and D.R. REINHART.

PSS-2 (9:15 a.m.) **Alternative water supply strategy in a high water use area of Coastal South Carolina: an approach to water resources management.** R.L. POTTS.

PSS-3 (9:45 a.m.) **Observations of energetic radiation from triggered lightning.** M. AL-DAYEH, V. CORBIN, B. WRIGHT, and J. JERAULD.

PSS-4 (10:00 a.m.) **Investigation of relativistic particle bursts from Jovian magnetosphere.** G. KESHISHIAN, M. ZHANG, and H. RASSOUL.

PSS-5 (10:15 a.m.) **Triple GEM tracking detectors for COMPASS.** K. DEHMELT, M.C. ALTUNBAS, J. EHLERS, J. FRIEDRICH, B. GRUBE, S. KAPPLER, B. KETZER, I. KONOROV, S. PAUL, A. PLACCI, L. ROPELEWSKI, and F. SAULI.

PSS-6 (10:30 a.m.) **Search for the quark-gluon plasma with the electromagnetic calorimeter of PHENIX at RHIC.** V. VESZPREMI, G. DAVID, and L. BAKSAY.

PSS-7 (11:00 a.m.) **Measurement of the photon structure function in two-photon collisions at LEP2.** G. BAKSAY and M. HOHLMANN.

PSS-8 (11:15 a.m.) **Light calibration system for the CMS forward Hadron calorimeter.** L. ALMEIDA and M. BAARMAND.

PSS-9 (11:30 a.m.) **Calibration of alignment sensors for the Endcap Muon chambers of the CMS experiment.** M. RIPERT, M. HOHLMANN and L. CARAWAY.

Session B, Friday, March 21, 2:00 pm – 5 pm (Sand Key Room 220)

PSS-10 (2:00 p.m.) **Determining the luminosity function of the galactic halo: the white dwarf database, age, and dark matter.** M. RUDKIN, T. OSWALT, T. HEINZ, K. JOHNSTON, S. RAFFERTY, J. HOLBERG, and N. SILVESTRI.

PSS-11 (2:15 p.m.) **Cosmic ray propagation in interstellar space.** A. FARAHAT, M. ZHANG and H. RASSOUL.

PSS-12 (2:30 p.m.) **Florida Tech's cosmic ray muon detection.** G. KARAGIORGI, J. SLANKER, and M. HOHLMANN.

PSS-13 (2:45 p.m.) **Analysis of MagLev sled oscillations on a magnetic track.** O. HANSON, A. SHURTS, L. CARAWAY, L. BAKSAY, and D.R. MEINKE.

PSS-14 (3:15 p.m.) **Conceptual designs for a mars deployable greenhouse.** C.L. SNYDER and J. MANTOVANI.

PSS-15 (3:30 p.m.) **A search for period variability in the extra-solar planet HD209458.** R. SAREEN, B. OCANA, and T. OSWALT.

PSS-16 (3:45 p.m.) **Collisionless magnetic field reconnection driven by perturbations on boundaries.** N.S. Al-SALTI and B.K. SHIVAMOGGI.

PSS-17 (4:00 p.m.) **Collisionless linear tearing modes: a unified formulation with electron inertia and parallel electron compressibility.** S. MANCAS, D. ROLLINS, R. EASTES, and B. SHIVAMOGGI.

PSS-18 (4:15 p.m.) **Thomas-Fermi model: non-extensive statistical mechanics approach.** E. MARTINENCO and B.K. SHIVAMOGGI.

Science Teaching (TCH):

Friday, March 21, 9:00 am – Noon (Pensacola Room 222)

TCH-1 (8:30 a.m.) **Who's afraid of the sciences?** G.E. ELLIS.

TCH-2 (8:45 a.m.) **Technology-assisted interactive learning in intro-ductory undergraduate chemistry.** M.J. ALEMAN, C.M. CONWAY, D.W. LOUDA, and J.E. HAKY.

TCH-3 (9:15 a.m.) **Chemistry resources online: faculty & student perspectives.** J.K. WILLIAMS.

TCH-4 (9:30 a.m.) **The art of strategic thinking: learning about organic synthesis in a small peer group format.** J.K. WILLIAMS.

TCH-5 (9:45 a.m.) **Of fluents and fluxions.** R.G. JORDAN.
TCH-6 (10:15 a.m.) **Science teaching in the faith-oriented classroom: snares and solutions.** D. W. LOVEJOY.
TCH-7 (10:30 a.m.) **Do your students need CPR?** B. POLK.
TCH-8 (10:45 a.m.) **Do we teach them how to think?** D. RAVIV.
TCH-9 (11:00 a.m.) **An epidemic in your classroom.** B.E. ROTHSTEIN and M. GOTTFRIED.
TCH-10 (11:15 a.m.) **Correlations among GPA's, SAT's, and hourly exam scores for students in a 1st-year biology course.** J.R. MONTAGUE.

Social Sciences (SOC):

Session A, Friday, March 21, 9:15 am - Noon (Cape Florida Room 316A/B)
SOC-1 (9:15 a.m.) **Event-related potential methodology: gender and alexithymia.** C. BERGER, G. STARRATT, and C. STARRATT.
SOC-2 (9:30 a.m.) **The event-related potential (ERP) as a physiological measure of response to emotional visual material.** E. LOPEZ, G. STARRATT, and C. STARRATT.
SOC-3 (9:45 a.m.) **Women of Color: a comparison of feminist and Black identity development.** H.K. ALI and L. PETERSON.
SOC-4 (10:00 a.m.) **Diagnosis and treatment of dissociative identity disorder: research on the controversies since publication of DSM-IV.** T.C. CHRISTOPHER, E.K. KESSENICH, K.R. MEYER, and T.H. PAXTON.
SOC-5 (10:30 a.m.) **The event-related potential (ERP) as a physiological measure of sensitivities to reward or punishment.** E.A. DRAKE, G. STARRATT, and C. STARRATT.
SOC-6 (10:45 a.m.) **Does locus of control moderate subjective distress experienced after the September 11th attack?** D.M. BUDASH and C. STARRATT.
SOC-7 (11:00 a.m.) **Color: an external effective cue on memory recall.** W. BUTCHER.
SOC-8 (11:15 a.m.). **Economics and the natural sciences: the rhetoric of Henry C. Carey.** A.J. CRISS.
SOC-9 (11:30 a.m.) **Assessing animal cruelty as a predictor of interpersonal violence.** R.A. FARRINGTON.
SOC-10 (11:45 a.m.) **Does content really matter? Implications of framing research.** E. BRAUTIGAM and L. SZUCHMAN.
Session B, Friday, March 21, 2:30 pm - 5 pm (Cape Florida Room 316A/B)
SOC-11 (2:30 p.m.) **Student collegiate-level, gender, & ethnicity and their effects on depression, worry, & substance abuse.** A. ROSADO.
SOC-12 (2:45 p.m.) **Event-related potential methodology in the study of personality.** D. FLORVILLE, G. STARRATT, and C. STARRATT.
SOC-13 (3:00 p.m.) **Skillstreaming's effectiveness in children aged eight to eleven.** J. A. WILLIAMS.
SOC-14 (3:15 p.m.) **Interracial dating: a look at college students' contemporary attitudes.** F. TAYLOR and F. MUSCARELLA.
SOC-15 (3:30 p.m.) **Sex and the internet: online sexual activities.** R. K. MARTINS and F. MUSCARELLA.

SOC-16 (3:45 p.m.) **Identification of binge drinkers.** D.L. GAWET and C. CRONIN.
SOC-17 (4:00 p.m.) **The evolution and perception of female homosexual behavior in humans.** A. SILER-KNOGL and F. MUSCARELLA.
Session C, Friday, March 21, 2:30 pm - 5 pm (Cape Florida Room 316C)
SOC-18 (2:30 p.m.) **The Mozart effect: music and memory.** J.J. MESSER.
SOC-19 (2:45 p.m.) **Sources of dissatisfaction at college.** J. MARKS, T. MAKOSIEJ, A. PELLICER, and R. BRYAN.
SOC-20 (3:00 p.m.) **The relationship between religiosity & depression among college students.** J.L. MARKS.
SOC-21 (3:15 p.m.) **Effects of four colors of paper on memory for lists of words.** A. PELLICER, T. MAKOSIEJ, J. MARKS, and R. BRYAN.
SOC-22 (3:30 p.m.) **The sociability of individuals as assessed by the Social Interaction Assessment (SIA, Wolfe, 2002).** W.J. WOLFE.
SOC-23 (3:45 p.m.) **Interpersonal integrity and resistance to conformity.** D.S. MOORE and R. BRYAN.
SOC-24 (4:00 p.m.) **The relationship between gender & aggression.** T. MAKOSIEJ.
Posters: Social Sciences, Friday, March 21, 8:00 am – 4 pm (Union Room 302)
POS-16 **The effects of matching and mismatching presence and absence of background music on free recall of concrete and abstract words.** A. PELLICER.
POS-17 **Personality differences in the perception of emotion.** E. RAMOS and C. STARRATT. Department of Psychology, Barry University, 11300 NE 2nd Ave., Miami Shores 33161.
POS-18 **A look at the relationship between college students and their parents.** R.C. AYR and L. SZUCHMAN.

2. Additional Abstracts:

AGR-13 Soil physical and chemical properties in a twenty-year old Loblolly Pine plantation in North Florida. L. A. WHILBY and O.U. ONOKPISE. Forestry and Natural Resources Conservation, Division of Agricultural Sciences, Florida A&M University, Tallahassee, 32307. Managing plantation of pines requires an understanding of soil properties in order to improve the soil quality of the soils in which the trees are growing. At the Quincy Research Farm of Florida A&M University, soil samples were collected from three separate blocks (2, 3, and 7) of planted pines that were twenty years old at the time of soil sampling. Mean soil pH was 5.44 in block 2, 5.49 in block in block 3, and 4.61 in block 7 respectively. Textural classes and other properties varied across blocks. The results indicated that management of this plantation will have to be block specific to reflect the utilization of soil nutrients among trees in different blocks.

AGR-14 Ground penetrating radar imaging and seepage characteristics of agricultural reservoirs, Southwest Florida. C. BRYANT (1), S. KRUSE (1), and E. FLAIG (2), (1) Univ. of South Florida, 4202 E. Fowler Ave., Tampa, 33620, (2) SFWMD, 2301 McGregor Blvd, Ft. Myers, FL 33901. The utility of ground

penetrating radar (GPR) for identifying features relevant to seepage characteristics of surface impoundments (reservoirs) in southwest Florida is assessed. These features include the clay-rich horizon that floors the surficial aquifer and the structure of impoundment dikes. GPR surveys were compared with seepage rates and sediment grain-size analysis from existing agricultural impoundments. The clay horizon can be imaged with GPR where the horizon lies within ~5m of the surface. GPR velocities show a local correlation with porosity measured within embankments, suggesting that GPR velocity measurements are a potential tool for identifying local zones of high porosity within embankments. Whole-impoundment seepage rates from three impoundments studies show a correlation with average embankment porosity

ENV-6 Historical blunders and fraud in chemistry. D.F. MARTIN and B.B. MARTIN, Institute for Environmental Studies, Department of Chemistry, University of South Florida, Tampa, FL 33620. Several examples of scientific breakthroughs have upon closer examination been blunders, and more recently two appear to have been deliberate frauds. Causes seem to be competition, external societal pressures, flawed experimental design, and lapses or limitations of collaborators. Examples include Deryagin water, cold fusion, discovery of Illinium, and the discovery of elements 116 and 118.

ENV-8 Use of chemically modified silica reagents in the removal of copper(II), cadmium(II), nickel(II), silver(I), and lead(II) Ions. C.A. BOWE and D.F. MARTIN. Institute for Environ. Studies, Dept. Chem., U. South Florida, 4202 East Fowler Avenue, Tampa, FL 33620. Water pollution by heavy metals is a major environmental problem worldwide. Treatment of aqueous media by silica gel is an inexpensive cleanup technology that represents an emerging field. Previous work describing the use of silica-supported reagents has established the possibility of using such coordinating agents as amines and thiols. These molecules were supported on silica gel for the removal of such heavy metals as lead, cadmium, and silver from aqueous media. Silica gel is currently being used as a support for various straight-chain bifunctional compounds such as mercaptoalcohols and aminoalcohols. The current investigation reports the use of silica gel chemically modified by 2-mercaptoethanol and N,N-dimethylaminoethanol in the removal of copper(II), nickel(II), silver(I), and lead(II) ions from standard solutions.

ENV-20 Mechanism of action in photodynamic therapy (PDT). K.D. BELFIELD, C. CORREDOR, and M.A. DESSOURCES, Dept. Chem. & School of Optics, UNIVERSITY OF CENTRAL FLORIDA, P.O. Box 162366, Orlando, FL 32816. This study reports the advances in the research of the mechanism of action (type I or type II) of new fluorene-based photosensitizer with potential applications in photodynamic therapy of cancer (PDT). The photosensitization process induced by the fluorene photosensitizer (PS) is explained through the study of their photophysical properties and evaluation of the effects of different additives. The radical scavenger 1-piperidinyloxy-2,2,6,6-tetramethyl- (9CI) (TEMPO) was used to verify the presence of free radicals, indicative of a type I mechanism of action. Sodium azide, 1,4-diazabicyclo[2,2,2]octane or DABCO, and deuterated solvents were used to determine the relative participation of singlet oxygen (a type II mechanism) in the photosensitization processes induced by the fluorene-based photosensitizers. The evidence suggests that a type II mechanism is dominant.

PSS-16 Collisionless magnetic field reconnection driven by perturbations on boundaries. N.S. Al-SALTI and B.K. SHIVAMOGGI. UNIVERSITY OF CENTRAL FLORIDA, Orlando, FL 32816-1364. Electron-inertia effects on the magnetic field reconnection induced by perturbing the boundaries of a plasma with a magnetic neutral surface inside are considered. Energetic of the tearing-mode dynamics with electron inertia which controls the linearized collisionless MHD are considered with a view to clarify the role of the plasma pressure in this reconnection process. The formation of a current sheet at the neutral surface as well as its subsequent evolution is investigated. We also look into the plasma-flow dynamics associated with this reconnection process.

PSS-17 Collisionless linear tearing modes: a unified formulation with electron inertia and parallel electron compressibility. S. MANCAS, D. ROLLINS, R. EASTES, and B. SHIVAMOGGI. UNIVERSITY OF CENTRAL FLORIDA, Orlando, FL 32816-1364. Collisionless linear tearing modes have been considered by including the effects of electron inertia as well as parallel electron compressibility. A fluid treatment is adopted for both electrons and ions. A unified linear tearing mode formulation is given. The parallel electron compressibility branch is shown to couple in general to the electron inertia branch in the presence of resistivity.

PSS-18 Thomas-Fermi model: non-extensive statistical mechanics approach. E. MARTINENCO and B.K. SHIVAMOGGI. UNIVERSITY OF CENTRAL FLORIDA, Orlando, FL, 32816-1364. In this work, the Tomas-Fermi Model for large atoms has been reformulated by incorporating the non-extensive entropy prescription. Analytical calculations have been given for some atomic properties like the total binding energy of the electrons in the atom. The Virial Theorem has been shown to be a robust result that holds also in the non-extensive entropy regime.

February 13, 2002 to: Dr. Theodore Rochow, Chairman, FAS Awards Committee. Please, no facsimile or email submittals.

ANNOUNCEMENTS

YEAR 2004 MEETING: The date and location of the Annual Meeting for Year 2004 have not yet been announced.

PERMANENT OFFICES FOR THE ACADEMY

The FAS office is located at the Orlando Science Center. The Executive Director is Dr. Gay Biery-Hamilton, and the Assistant Director is Ms. Rebecca Amonette. The address and telephone numbers are below:

Florida Academy of Sciences
Orlando Science Center
777 East Princeton St.
Orlando, FL 32803
407-514-2079
gbiery-hamilton@osc.org

FLORIDA ACADEMY OF SCIENCES
2003 ANNUAL MEETING PROGRAM SUMMARY

TIME	EVENT
Thursday, 20 March 3:00 p.m. – 5:30 p.m.	FAS Registration & Information Desk, Hallway outside Key West Room 218 ABCD (on the 2nd-floor of UCF Student Union)
Thursday, 20 March 5:30 p.m. – 7:00 p.m.	Dinner on your own at local restaurants (information at FAS Registration Desk)
Thursday, 20 March 7:00 p.m.	FAS Council Meeting, Pensacola Room 222 (on the 2nd-floor of UCF Student Union)
Friday, 21 March 7:30 a.m. – 4:00 p.m.	FAS Registration & Information Desk, Hallway outside Key West Room 218 ABCD (on the 2nd-floor of UCF Student Union)
Friday, 21 March 8:00 a.m. – 12:30 a.m.	FAS Concurrent Paper Sessions (see Registration Desk for room locations)
Friday, 21 March 12:00 p.m. – 12:30 p.m.	Lunch (information at FAS Registration Desk)
Friday, 21 March 12:30 p.m. – 2:15 p.m.	Business Meeting & Gale Plenary Lecture in Cape Florida Room 316 ABCD (on the 3rd-floor of UCF Student Union)
Friday, 21 March 2:30 p.m. – 5:00 p.m.	FAS Concurrent Paper Sessions (see Registration Desk for room locations)
Friday, 21 March 6:00 p.m. – 7:00 p.m.	Reception (TBA)
Friday, 21 March 7:00 p.m. – 10:00 p.m.	FAS Banquet & Medallist Address, Key West Room 218 ABCD (on the 2nd-floor of UCF Student Union)
Saturday, 22 March 7:30 a.m. – 12:00 p.m.	FAS Registration & Information Desk, Hallway outside Key West Room 218 ABCD (on the 2nd-floor of UCF Student Union)
Saturday, 22 March 8:30 a.m. – 1:00 p.m	FAS Concurrent Paper Sessions (see Registration Desk for Room Locations)
Saturday, 22 March 8:30 a.m. – 4:30 p.m	Junior Academy of Science Annual Meeting (UCF COOM & VAB buildings, see Registration Desk for Room Locations)
Saturday, 22 March 12:00 – 2:00 p.m	Lunch on your own at local restaurants (information at Registration Desk)
Saturday, 22 March AFTERNOON	Trips to various local attractions (information at Registration Desk)

SPECIAL SESSION
SCIENCE AND THE LAKE: BASELINE ENVIRONMENTAL STUDIES OF LAKE OKEECHOBEE AND ITS WATERSHED

FRIDAY 2:00 p.m. - EDGEMONT ROOM 224
CHARLES HANLON, SOUTH FLORIDA WATER MANAGEMENT DISTRICT, presiding

2:00 p.m. SS-1 Overview of the pre-drainage environmental setting of Lake Okeechobee. B.R. WHARTON. HDR, Inc., 2202 N. Westshore Blvd., Suite 250, Tampa, FL 33607. This paper briefly chronicles the pre-drainage (i.e., pre-1884) environmental history of Lake Okeechobee. Lake Okeechobee was first described in 1575 by a Spanish shipwreck survivor but otherwise remained terra incognita until the 2nd Seminole Indian War. Beginning in the 1870s-1880s, sportsman, naturalists, and commercial interests re-discovered the lake. This paper traces the pre-drainage environmental features of the lake, particularly the vegetation communities, based on the mid-19th century General Land Office Survey records, supplemented by published accounts of early naturalists, engineers, and commercially-inspired expeditions. Emphasis is given to changes in the vegetation communities that occurred in the wake of late-19th and early-20th century channelization projects undertaken by Hamilton Disston and the U.S. Army Corps of Engineers.

2:15 p.m. SS-2 Some stages in the evolution of Lake Okeechobee. P.J. GLEASON (1) and P.A. STONE (2). (1) CDM, Inc, 1601 Belvedere Rd., West Palm Beach, FL 33406, (2) SC Dept. Health & Environ. Ctl., Columbia, SC 29201. This shallow low-elevation (both ca. 6 m) sub-tropical lake is post-glacial in origin and in its earliest wet stages held seasonal marsh, shown by calcitic mud ("marl") at least as old as 12,000 BP (^{14}C yr) in deeper parts and as young as 6300 BP toward the edges. "Drowned" marsh peat near the south shore and peat in the adjacent Everglades rose in elevation after 5500-5000 BP, up at least to ca. 2500 BP, forming a broad dam that allowed the rise in maximum lake level. By ca. 3000-2500 BP a muck (mineral-rich organic mud) instead deposited in the adjacent Everglades and must have involved outwash from the lake. Muck-mound islands near the south shore also started then. Soon after ca. 1400 BP the southward-growing beach ridge of the eastern shoreline had reached present Canal Point. Organic lake mud, and thus a eutrophic condition, dates back to at least ca. 1500 BP and possibly much earlier.

2:30 p.m. SS-3 Results of monitoring programs to control phosphorus discharges in the Lake Okeechobee watershed. J. ZHANG (1),

B. WHALEN (1), G. RITTER (1), and E.J. ALBERS (1). (1) South Florida Water Management District, 3301 Gun Club Rd., West Palm Beach, FL 33406. To control phosphorus (P) runoff from land uses in the Lake Okeechobee watershed, regulatory programs were implemented and total P concentration standards in discharge flow based on land use were established in the late 1980s. Here, baseline conditions are summarized and trends are compared in runoff total P concentrations among land uses based on data collected from 1991 to 2000. The monitored land uses mainly include improved beef pasture, dairy, row crop, and citrus, which have been identified as high P contributing land uses. The baseline and trend information on total P discharge vs. land uses will help managers to evaluate the effectiveness of past P control programs and establish a starting point for future programs designed to reduce P loads to the lake.

2:45 p.m. SS-4 Lake Okeechobee water quality trends. R.T. JAMES. South Florida Water Management District, 3301 Gun Club Road, West Palm Beach, FL 33411. Lake Okeechobee, a large, shallow, subtropical lake is experiencing cultural eutrophication from agricultural runoff. Water quality, monitored on a monthly to biweekly schedule since 1972, is analyzed to answer three questions: 1) Do trends exist? 2) Are trends linear or more complex? 3) Are there potential explanations for these trends? I limited the analysis to total phosphorus (TP), total nitrogen (TN), chlorophyll a (CHLA), Secchi Disk Depth (SECCHI), and Alkalinity (ALK). SECCHI declined from 0.57 to 0.33 m, coincident with expansion of mud sediments. TP increased from 50 mg L-1 to a plateau of approximately 100 mg L-1 in the 1990s and then increased further, consistent with reduced sediment P assimilation. TN increased from 1.3 to 2.5 mg L-1 in the early 1980s and then declined, coincident with reduced loads. ALK declined from 140 to 84 meq L-1 of CaCO3 in the late 1990s, as loads declined, but has since increased. CHLA has not changed, perhaps due to reduced available light.

3:00 p.m. SS-5 Factors controlling phytoplankton dynamics in Lake Okeechobee, Florida. B. SHARFSTEIN, T.L. EAST, and R.P. MAKI. S. Fl. Water Mgt. Dist., 3301 Gun Club Road, West Palm Beach, FL 33416. Nutrient and light limitation bioassays and photosynthesis-irradiance curves are routinely performed using natural phytoplankton assemblages in Lake Okeechobee to identify the specific factors that influence phytoplankton dynamics. Phytoplankton biomass was dominated by blue-greens (43%), diatoms (36%), and green algae (10%). Light limitation accounted for 59% of all bioassay outcomes, while phosphorus was never found to be limiting. The occurrence of light limitation could be predicted by examining the secchi depth:total depth ratio, chlorophyll a, and dissolved inorganic

nitrogen concentrations. Photosynthetic parameters were similar at all sites during the period of high lake stage prior to the drought of 1999 and differed thereafter. Further analysis is underway to determine if lake stage and related environmental variables help explain this change.

3:15 p.m. BREAK

3:30 p.m. SS-6 Chemotaxonomic assessment of Lake Okeechobee phytoplankton: natural samples and in vitro experimentation into the effects of light levels. K. SKOOG and J.W. LOUDA. Organic Geochemistry Group, Department of Chemistry and Biochemistry, Florida Atlantic University, 777 Glades Road, Boca Raton 33431. Pigment-based chemotaxonomy uses the ratios of certain marker pigments (e.g. Chlorophyll-b, fucoxanthin, etc.) to chlorophyll-a (CHLa) to estimate the amount of taxon specific (e.g. chlorophytes, diatoms, etc.) contributions to the total CHLa pool. In this way, one may objectively estimate the taxonomic makeup of a microalgal community. Our recent studies of natural Lake Okeechobee samples reveals mixed populations of cyanobacteria (zeaxanthin, echinenone), chlorophytes (CHLb, lutein), diatoms (fucoxanthin) and cryptophytes (alloxanthin). The effect of light levels, know to alter some of these ratios and thus skew estimate validity, is being examined for the most critical cases in Lake Okeechobee, namely echinenone and zeaxanthin for the estimation of cyanobacteria. We are zeroing in on echinenone as the most conservative marker for this taxon in this lake. However, results appear to be directing us to use both of these pigments. This will require adjustment of the contribution of zeaxanthin by echinenone (keto-carotenoid) producing cyanobacteria. Results of the study of Lake Okeechobee will also be detailed.

3:45 p.m. SS-7 Status of submerged vegetation in Lake Okeechobee, and response to changes in water level. K.E. HAVENS, B. SHARFSTEIN, T.L. EAST, R.P. MAKI, and A.J. RODUSKY. South Florida Water Management District, 3301 Gun Club Road, West Palm Beach, FL 33406. In 1999, after several years of high water level, submerged aquatic vegetation (SAV) in Lake Okeechobee was estimated to cover just 3,000 acres, down from nearly 40,000 acres in the early 1990s. A managed recession of the lake in spring 2000 dropped water levels and set into motion a dramatic recovery of the community. The SAV had increased to over 43,000 acres by summer 2002. The community initially (2000-01) was dominated by the macro-alga Chara, but this was replaced by vascular plants (Vallisneria, Potamogeton, Najas, and Hydrilla) in 2002. Species diversity nearly doubled. Strong links between SAV biomass and (1) water depth, and (2) total suspended solids were documented, and a multivariate

regression model was developed. It explained a large percentage of the variation in lake-average SAV biomass based on the two environmental conditions.

4:00 p.m. SS-8 Temporal changes in Lake Okeechobee's marsh landscape - a dynamic marsh. C. HANLON. South Fl. Water Management Distric, PO Box 24680, West Palm Beach, FL 33416-4680. Remote sensing and GIS technology were used to map the distribution of emergent macrophytes in most of Lake Okeechobee's 40,000 ha marsh. Temporal changes in plant community distribution were evaluated by comparing current and historical (1970s and 1990s) landscape coverages. Large changes in bulrush (*Scirpus californicus*), cattail (*Typha* sp.), spikerush (*Eleocharis cellulose*) and knot-grass (*Paspalidium geminatum*) distribution were quantified along the lakeward edge of the marsh (40 km). Many of the changes in plant distribution occurred in conjunction with record high and low lake levels. At higher elevations, large scale landscape changes have resulted from the invasion of 20,000 acres of the exotic plant torpedo-grass (*Panicum repens*). Operational management efforts aimed at reestablishing native vegetation in areas impacted by torpedo-grass are also evaluated.

4:15 p.m. SS-9 Fish population structure within major littoral zone plant communities of Lake Okeechobee. D.D. FOX, J.B. FURSE, and L.A. BULL. Florida Fish and Wildlife Conservation Comm., 3991 S.E. 27th Ct., Okeechobee, FL 34974. Vegetated areas of the littoral zone of Lake Okeechobee were sampled with 0.08-ha block nets and Wegener rings over a three year period to quantitatively evaluate fish populations in important vegetation communities. Rank correlation of abundance and biomass of the 26 most abundant fish species indicated an overall similarity in species composition in all vegetation types sampled. Differences did occur for size-specific species composition (biomass dependent) between some vegetation types. Changes in water level and differences in plant community structural complexity and water quality between vegetation communities exerted the greatest effect on fish distribution.

4:30 p.m. SS-10 Interagency efforts to restore Lake Okeechobee: The Lake Okeechobee Protection Program. S. GRAY. Lake Okeechobee Division, South Florida Water Management District. Lake Okeechobee provides a number of values to society and nature including water supply, flood protection, a multimillion dollar sport and commercial fishery, and habitat for wading birds, migratory waterfowl, and the federally endangered Everglades Snail Kite. These values have been threatened in recent decades by excessive phosphorus loading, harmful high and low water levels, and rapid expansion of exotic plants. The Lake Okeechobee Protection Program

(Chapter 00-130, Laws of Florida), passed by the 2000 Legislature, committed the State of Florida to restore and protect Lake Okeechobee. An integrated watershed and Lake management strategy is being used to improve the condition of Lake Okeechobee. This strategy is an interagency effort based on the implementation of phosphorus source control programs that include Best Management Practices (BMPs) at the parcel level, implementation of sub-basin and regional phosphorus control technologies, and in-Lake remediation projects. The planning, design, and implementation of these projects is heavily reliant upon sound science provided by the Interagency Team and its partners.

4:45 p.m. SS-11 Water quality of the channelized Kissimmee River and expectations for improvement after restoration. B.L. JONES and D.J. COLANGELO. Kissimmee Div. MSC 4920, S. Fla. Water Mngmt. Dist., Box 24680, W. Palm Beach, FL 33416. Channelization of the Kissimmee River, accompanied by loss of wetlands, altered flow regimes, and agricultural development within the basin, produced hypoxic conditions and higher phosphorus (P) loads to Lake Okeechobee. Completion of the first phase of river restoration in early 2001 succeeded in raising dissolved oxygen concentrations in the river channel. Lower P concentrations are also expected after natural floodplain hydroperiod is re-established, although the most concentrated sources of incoming P are downstream of the project. Restoration of natural, seasonal flows will delay most P loading until later in the year, when potential impact on lake productivity may be lower. Increased P loading from the river's headwater, Lake Kissimmee, may be explained by recent influences on this lake, which may not be persistent.

AGRICULTURAL AND NATURAL RESOURCES

FRIDAY 9:00 a.m. - KEY WEST ROOM 218A
MARK WADE, UNIVERSITY OF FLORIDA, presiding

9:00 a.m. AGR-1 Ecology and soil and plant analyses of wild hydrangea (*Hydrangea arborescens* L.) for the treatment and prevention of kidney stones. R.S. TUBBS and R.N. GALLAHER. U. Florida, Gainesville, FL 32611. Kidney stones, the accumulation of mineral salts that lodge anywhere along the urinary track, 80%, of which are Ca stones, affect 13% of Americans. The objectives of this research was to determine the ecological habitat where wild hydrangea grows in the eastern US and determine plant partitioning of fresh and dry matter, mineral element analysis of plant parts, and soil properties of a wild hydrangea habitat. Teas, extracts, food consumption, tinctures, decoctions, and powders are prepared

from numerous wild medicinal plants for increasing urine flow, passing kidney stones, and other urinary problems. Decoctions from roots and rhizomes of wild hydrangea, one of these wild plants, have been used for that purpose. Three replications of wild hydrangea plants were collected from a native habitat in Wayne County, Tennessee in 2001. Plant parts and soil from each site were analyzed for plant mineral composition and soil properties. Other ecological data were also collected. Wild hydrangea grew along stream banks on colluvial soil with a silt loam to a sandy clay loam texture and in about 96% shade. Soil minerals were all adequate with the exception of low test for P. Roots and rhizomes made up 35% of the plant dry matter and contained significant quantities of 10 essential minerals for plants and animals.

9:15 a.m. AGR-2 Phosphorus budget analysis for the northern Lake Okeechobee watershed, Florida. J.G. HISCOCK (1), C.S. THOUROT (1), and J. ZHANG (2). (1) Mock Roos & Associates, Inc., 5720 Corporate Way, West Palm Beach, FL 33407, (2) South Florida Water Management District, 3301 Gun Club Rd., West Palm Beach, FL 33406. Average annual phosphorus (P) budgets were estimated based on current land use and practices for the northern Lake Okeechobee watershed. Phosphorus import, export, and net import coefficients in terms of kg P/ha-yr were determined for each land use based on landowner surveys and literature data. These coefficients were applied to the appropriate land use area with a Geographic Information System (GIS) to obtain a basin-wide P budget. Phosphorus runoff load was estimated based on measured data and literature values of P concentrations and runoff estimates. The P loads to the lake were obtained from measurements. On-site P storage and wetland assimilation values were estimated using a mass balance approach.

9:30 a.m. AGR-3 Root growth interactions between *Muhlenbergia capillaris* L. and *Imperata cylindrica*. L.H. DUEBERRY (1), O.U. ONOKPISE (1) and J. NORCINI (2). (1) Forest. Nat. Res. Conservation, Division of Agricultural Sciences, Florida A&M University, Tallahassee, FL 32307, (2) N. Florida Research and Education Center, IFAS, University of Florida, Quincy, FL 32351. Hairy awn muhly grass (*Muhlenbergia capillaris*, L.) was planted with cogongrass (*Imperata cylindrica*, L) in one gallon size greenhouse pots to evaluate the use of a native grass species for the biological control of an invasive species. Pots were arranged in three groups containing cogongrass (C), muhly grass (M), and muhly grass plus cogongrass combination (CM) respectively. The experimental design was a randomized complete block design in three replications with three treatment pots per replication. Root biomass was determined for each group of plants at 17 wks after planting (WAP). Overall, mean root biomass for cogongrass

was significantly lower when grown in combination with muhly grass (CM = 11.89 g per replication) compared to when grown alone (c = 19.87 g per replication). The results revealed that hairy awn muhly grass may be used to control the growth of cogongrass. Implications for managing invasive species with native grass species are discussed.

9:45 a.m. AGR-4 Methyl bromide phase-out: economic implications for Florida tomato growers. J. MCGUIRE and M.A. WADE. Food and Resource Economics Dept., University of Florida, Indian River REC, 2199 South Rock Road, Fort Pierce, FL 34945. Florida is the nation's number one producer of fresh market tomatoes. Growers that produce tomatoes rely heavily on the use of the pre-plant fumigants Methyl Bromide (MBr) and chloropicrin to eradicate weeds, soil pathogens and nematodes. Applied to more than 93 percent of the state's tomato acreage, MBr has been identified as a major factor in depletion of the ozone layer and as a result is being phased out by 2005. This research examines the economic implications associated with the MBr ban on Florida vegetable producers, specifically tomato growers. Of the 60 million pounds of MBr used each year 75percent goes to fumigate soil prior to planting. Use on tomatoes accounts for one-half of all MBr used for soil fumigation in Florida. Alternatives to MBr are discussed from both a performance and cost perspective. Issues related to the continued use of MBr in developing countries are also examined. As a result of the ban, Florida growers will experience an increase in production costs of $23 per acre, relative to growers in developing countries, plus additional loses from reduced crop yield. Total industry loses in Florida are forecast at approximately $200 million.

10:00 a.m. AGR-5 Strip-till management of sweet corn (*Zea mays* L.) following rye (*Secale cereale* L.). R.N. GALLAHER. University of Florida, Gainesville, FL 32611. Sweet corn is a multimillion-dollar crop in Florida. This 2-year study was conducted at the Plant Science Research and Education Unit, Citra, FL in 2001-2002. The primary objective of this study was to determine yield and corn quality effects from tillage treatments on five popular sweet corn varieties. Main effects were conventional till versus no-till planting into a winter crop of rye converted to a mulch by use of contact herbicides. Sub treatments were five sweet corn varieties as follows: 'Silver Queen', 'Golden Queen', 'Merritt', 'Florida Stay Sweet', and 'Peaches and Cream'. Both tillage treatments were planted using a Brown-Harden strip-till planter, in four-row plots 3.64 m wide and 10.67 m long. Appropriate chemical weed control, overhead irrigation, and UF, IFAS extension fertilizer recommendations were used. No differences between tillage treatments were found for any variable measured. For all data

collected a significant interaction occurred between years and corn varieties. Total fresh ear yield in 2001 ranged from a high for Silver Queen of 17,494-kg ha-1 to a low of 11,076-kg ha-1 for Peaches and Cream. Generally, total sweet corn yield the second year was greater than the first year. No-till sweet corn was not only equal to conventional till but also offers conservation and cost effective management benefits.

10:15 a.m. BREAK

10:30 a.m. AGR-6 Chemical weed control for two varieties of cowpea (*Vigna unguiculata* L.). D.C. YODER, R.N. GALLAHER, and G.E. MACDONALD. University of Florida, Gainesville, FL 32611. Weeds are major economic pests for growing cowpea in Florida. The objective of this investigation was to test a nematode susceptible versus a non-susceptible variety ('Iron Clay' and 'White Acre', respectively) as main effects in a split-plot experimental design. Sub plots included five weed control treatments as follows: 1) untreated check, 2) Prowl – 0.84 kg ai ha-1 PRE, 3) Prowl – 0.84 kg ai ha-1 PRE + Valor – 0.02 kg ai ha-1 PRE, 4) Prowl – 0.84 kg ai ha-1 PRE + Caparol - 1.4 kg ai ha-1 PRE, and 5) Dual Magnum – 1.46 kg ai ha-1 PRE + 0.036 kg ai ha-1 POST. Average dry matter yield of Iron Clay was greater than White Acre (310-g m-2 versus 212-kg m-2). All chemical treatments effectively controlled weeds compared to the control, which was dominated by *Amaranthus* sp. among others. Initial plant stunting occurred from POST application of Pursuit. Although the plants appeared to grow out of this stunting, dry pod and seed yields were negatively impacted by the POST application of Pursuit compared to other weed control treatments.

10:45 a.m. AGR-7 Cowpea (*Vigna unguiculata* L.) variety effects on the succeeding turnip (*Brassica rapa* L.) crop using three single-factor experimental designs. K.A. SEAMAN, R.N. GALLAHER, K-H. WANG, and R. MCSORLEY. University of Florida, Gainesville, FL 32611. Selection of the proper cowpea variety can impact fresh pod yield, residual N from the crop residue, and severity of nematode infection of the succeeding crop. The primary objective of this study was to investigate impact of cowpea varieties on plant and pod yield and N accumulation available for a succeeding turnip crop. Five varieties were investigated including: 'Iron Clay', 'Texas Cream 12', 'Mississippi Cream', 'White Acre', and 'California Blackeye'. Three separate but adjoining experiments were conducted, including a completely randomized, a randomized complete block, and a Latin square, and were placed in the field appropriately to use blocking for control of experimental error. Variety, N contents, and nematode relationships were determined in relation to the

succeeding turnip crop as well as statistical parameters from use of the three single-factor experimental designs. Generally, Iron Clay produced the greatest plant dry matter (ranging from 428-g m-2 to 836-g m-2 among the three designs, while other varieties produced less (ranging from a low of 162-g m-2 to 514-g m-2. However, Iron Clay produced the lowest pod dry matter yields while California Blackeye provided the greatest dry pod yield.

11:00 a.m. AGR-8 Turnip (*Brassica rapa* L.) and mustard (*Brassica juncea* L.) yields as impacted by plant population and nitrogen fertilizer. B. BRACHO and R.N. GALLAHER. University of Florida, Gainesville, FL 32611. Not only is turnip and mustard grown commercially but by home gardeners as well. The primary objective of this study was to test for optimum plant populations and N fertilizer requirements to maximize yield. Two separate experiments were conducted side by side using plant populations of 2, 4, and 6 plants m-2 as main effects and five N rates (0, 56, 112, 168, and 224 kg N ha-2) were sub treatments in split-plot experimental designs. Turnip top dry matter increased with increasing plant population as follows: 2, 4, and 6 plants m-2 average yields were 36.3, 62.3, and 70.8 g m-2, respectively. Mustard top dry matter increased as follows: 2, 4, 6, plants m-2 average yields were 171, 212, and 321g m-2, respectively. These data illustrate that top dry matter yield may have not been achieved even at the highest plant population. On the other hand, turnip root dry matter appeared to peak at 4 plants m-2. Turnip root dry matter changed as follows: 2, 4, 6, plants m-2 average yields were 28.4, 43.1, and 39.5 g m-2, respectively. The much lower plant dry matter top yield for turnip can be explained by the partitioning of a significant portion of photosynthate to the roots as compared to mustard. Generally, yields of both turnip and mustard peaked at about 112 kg N ha-1, which is close to the present University of Florida, Cooperative Extension Service recommendation for these crops.

11:15 a.m. AGR-9 Long-term phosphorus retention in soils loaded with cow manure in the Lake Okeechobee watershed. E.G. FLAIG (1), V.D. NAIR (2), and D.A.GRAETZ (2), (1) SFWMD 2301 McGregor Blvd. Ft. Myers 33901, (2) Univ. of Florida, P.O. Box 110510 Gainesville, FL 32611. Phosphorus (P) loads from intensively managed dairy operations to Lake Okeechobee have been a long-term problem. The dairy land in the watershed has received substantial P loads from cow manure and a large fraction of the applied P has remained in the soil. It is believed that the phosphorus will leach out of the soil and remain a long-term pollution problem. Several abandoned dairy sites and adjacent native sites were selected for site surveys and chemical analysis of the surface and subsoils. The P load applied to the land at each dairy was estimated using the fertilization history and cattle management records with estimated manure P

loads. It was found that 75 to 90 percent of the phosphorus applied to the soil was found to remain in the soil many years after high intensity animal confinement activities ceased.

11:30 a.m. AGR-10 Yield and disease ratings of nine peanut (*Arachis hypogaea* L.) varieties grown conventional versus no-till with a strip-till Planter. J.L. MCKINNEY (1), R.N. GALLAHER (1), J.A. BALDWIN (2), and B. KEMERAIT (2). (1) U. Florida, Gainesville, FL 32611, (2) U. Georgia, Tifton, GA 31793. Peanut in one of the leading agronomic crops that impacts Florida's farmers and the state economy. The objective of this investigation was to compare newly developed peanut varieties under conventional till versus no-till management for yield and disease incidence. The two tillage treatments were main treatments and nine varieties were sub treatments in a split-plot experimental design. Experiment was conducted at the Plant Science Research and Education Unit of U. Florida, IFAS, Citra, FL in 2002. Peanut varieties in the order of maximum pod yield to the least yield were as follows: 'C-99-R', 'Hull', 'Georgia Green', 'Norden', 'Carver', 'Southern Runner', 'Andrue II', 'Florunner', and 'Andrue 93', with yields, averaged over tillage, of 5,112, 4,941, 4,583, 3,718, 3,316, 2,934, 2,981, 2,551, and 1,741 kg ha-1, respectively. Yield and diseases were not affected by tillage, which means that no-till management with its environment, soil, equipment, labor, and energy conservation advantages can be realized for production in Florida. Generally the high yielding varieties also had the lowest ratings for diseases.

11:45 a.m. AGR-11 Results of monitoring programs to control phosphorus discharges in the Lake Okeechobee watershed. J. ZHANG (1), B. WHALEN (1), G. RITTER (1), and E.J. ALBERS (1). (1) South Florida Water Management District, 3301 Gun Club Rd., West Palm Beach, FL 33406. To control phosphorus (P) runoff from land uses in the Lake Okeechobee watershed, regulatory programs were implemented and total P concentration standards in discharge flow based on land use were established in the late 1980s. In this paper, baseline conditions are summarized and trends are compared in runoff total P concentrations among land uses based on data collected from 1991 to 2000. The monitored land uses mainly include improved beef pasture, dairy, row crop, and citrus, which have been identified as high P contributing land uses. The baseline and trend information on total P discharge vs. land uses will help managers to evaluate the effectiveness of past P control programs and establish a starting point for future programs designed to reduce P loads to the lake.

12:00 p.m. AGR-12 Weed management, chemical use and environmental adaptation on Florida cattle operations. M.A. WADE and T.

M. MINTON. Food and Resource Economics Dept., University of Florida, Indian River REC, 2199 South Rock Road, Fort Pierce, FL 34945. Weed management practices, including cultural practices such as burning, mowing, disking, and the use of chemicals, are examined as a means of maximizing forage production on Florida beef cattle operations. Environmental adaptation or the process of changing the environment to optimize productive economic returns from land resources is also explored. Data from a statewide survey of beef producers was used to compare cultural practices and costs by size of operation and geographic region. Most individual pasture management practices, such as chemical and fertilizer application practices and costs, were not different between operational size groups. Cultural practices, like mowing and fertilizer application, and costs, were not statistically different between production regions. Overall pasture renovation costs per acre did differ by size of operation and region. Economic factors influencing land improvement and environmental adaptation, primarily cattle prices, chemical prices and income levels, also differed by size and region. The information provided in this study can be used as a tool for producers to assess their operational costs of production and management practices

12:15 p.m. BUSINESS MEETING: AGRICULTURAL AND NATURAL RESOURCES
MARK WADE, presiding

ANTHROPOLOGICAL SCIENCES

FRIDAY 9:00 a.m. – CAPE FLORIDA ROOM 316C
LINDA TAYLOR, UNIVERSITY OF MIAMI, presiding

9:00 a.m. ANT-1 Food choice by free-ranging Lemurs in South Florida. A.L. BADEN and L.L. TAYLOR. U. Miami, Dept. Anthro., P.O. Box 248106, Coral Gables, FL 33124 Ringtailed lemurs (*Lemur catta*) and bamboo lemurs (*Hapalemur griseus*) are two taxa which range freely in a 19 acre forest habitat at the Lemur Conservation Foundation, Myakka City, FL. Scan sampling techniques were used in June and July 2002, to gather data designed to test hypotheses about plant choice. We hypothesized that the bamboo lemur would exploit the fewest plant resources because of its specialized bamboo diet. A total of 677 samples were analyzed. Ringtails utilized 8 plant species whereas bamboo lemurs fed on 10. Ringtails preferred live oak leaves (N=19, 7.9% of samples) and pine needles (N=14, 5.8% of samples), whereas bamboo lemurs preferred young grass shoots (N=115, 26.4% of samples) and bamboo shoots (N=102, 23.4% of samples.

This research was supported in part by a General Research Grant (LLT) and a Summer Research Fellowship for Minorities and Women (ALB).

9:15 a.m. ANT-2 Foraging and habitat use in a colony of six Lemur species in Myakka City, FL. B. GROSSI (1), M. HOFFINE (1), and L.L. TAYLOR (2), (1) Lemur Conservation Foundation, P.O.B 249, Myakka City, FL, (2) Univ. Miami, Dept. of Anthropology, P.O.B. 248106, Coral Gables, FL 33124. Established in October 1999, the Foundation houses 6 lemur species in a semi-free ranging 13-acre forest habitat. Little is known about how lemurs adapt to novel environments. To document how lemurs adapt to a Florida habitat, foraging and location frequency data were collected on all species. The lemurs were observed to eat 15 different native and exotic plant species. None suffered any ill effects. The lemurs also preferred different subhabitats within the forest. Some species were more terrestrial than others, spending as much as 30% of their time there. These data suggest that all species can adapt to novel environments, which bodes well for plans to reintroduce individuals to the wild.

9:30 a.m. ANT-3 Analysis of human skeletal material at Little Salt Spring, Florida. C. ALVAREZ. University of Miami, Department of Anthropology, P.O. Box 248106, Coral Gables 33124. The Little Salt Spring site, slough on the western coast of Florida, consists of a large sinkhole, basin, and in which organic material, including human skeletal remains from the Paleoindian/Archaic period, are preserved. The remains of approximately 50 individuals were recovered at the site from 1959 through 2002, including 2 nearly complete human skulls and several mandibles. These materials have been tentatively dated to 6000 years BP. In this paper I describe the site, the history of investigations, and remains recovered to date. I use the data from the recovered dentition of the Little Salt Spring sample, including the presence or absence of enamel hypoplasia, caries, abscesses, and or other pathologies as a general indicator of the overall health and nutrition of the individuals at who lived around Little Salt Spring.

9:45 a.m. ANT-4 The gendered cocktail: patterns of alcohol consumption and advertising in South Florida. F. KUCHKARIAN. Univ. of Miami, Dept. of Anthropology, P.O. Box 248106, Coral Gables, FL 33124. Love, romance, fun, fearlessness, sexuality are a few of the images alcohol advertisements evoke in order to attract specific consumers. Advertisers seek to shape personal preference of specific consumers. But do they? In this paper I test the hypotheses that advertising has a quantifiable impact on consumption patterns. I collected systematic data on more than 1000 alcoholic beverage orders – 500 from an up-scale South

Beach setting and 500 from a microbrewery restaurant. For each, I noted the age and sex of the consumer. To test for a relationship between advertisements and consumer, I compared the sex and age class of the person ordering with the item ordered in each setting. Patterns in the two venues were compared to find differences that might be tied to socioeconomic differences. These analyses were then linked to specific ads and their messages.

10:00 a.m. BREAK

10:15 a.m. ANT-5 Ice cream and sex: is there a pattern? S. FETZKO. Dept. Anth., U. Miami, P.O. Box 248106, Coral Gables, FL 33124. I gathered data on male and female orders for ice cream to test the hypothesis that females and males would behave differently. Females were predicted to order reduced-calorie ice creams in smaller serving sizes. Females ordering was also predicted to be influenced by who accompanied them, whereas male orders should be unaffected by these variables. I observed 400 order events at a local ice cream shop and noted the sex of the person ordering, order type, order size, and party composition. Female orders provided the fewest calories and grams of fat, on average. The results supported the hypotheses above, except for the finding that males appeared to order smaller servings when accompanied by a single female companion. The study highlighted differences in male and female eating patterns. These differences may be due to societal pressure on females to eat less to be thin. Males may order smaller sizes to conform to their female companion's preferences.

10:30 a.m. ANT-6 Smoking, socio-economic status, and gender among Hispanic adolescents in Miami Dade County, FL. K. BRELSFORD. Dept. Anth, Northern Arizona Univ., Flagstaff, AZ. In 2001, the state of Florida granted the University of Miami funding from the Florida tobacco settlement to explore adolescent tobacco use in Miami/Dade County. Ethnographic methods were employed to study the smoking and tobacco use patterns of adolescents, age 11 to 15. This particular paper will explore smoking meaning and belief among Hispanic youth. While some research emphasizes peer pressure, lack of education, and desires to feel 'cool' as primary reasons for adolescent smoking uptake and continued tobacco use, these results are contrary. Participants explain smoking behavior based on perceived gender roles, social status, and familial tobacco use. Self-image and socio-economic status appear to be significantly linked to Hispanic smoking; outreach and prevention programs must be designed to address these specific issues.

10:45 a.m. ANT-7 The "Cubanization" of Southern Florida: 150 years of change. M. FARALDO and M. FARALDO. Univ. of Miami, Dept. of Anthropology, P.O. Box 248106, Coral Gables, FL 33124. In 1871, Cuba was, as it is now, without personal freedom and democratic government. Spain ruled Cuba, running sugar mills, cigar factories, and imbuing Cuba's daily life with Spanish influences. Enslaved Africans became part of the labor force and the force of cultural change. Historically, some Cubans have fled to Key West and Southern Florida seeking independence and freedom. By 1871, Key West's population had swelled by this influx to more than 5,650 from 2,913 in 1860. Today, exiles continue to arrive in Florida, where they constitute more than 60% of the state's population. We present data on politics, faith, and family life variables, drawn from interviews and historical documents in the San Carlos Institute which illustrate the hybrid known as Cuban-American culture. The study was supported, in part, by the Medley Law Center.

11:00 a.m. ANT-8 Blood pressure variation in urban Caribbean-Americans. R.A. HALBERSTEIN. Dept. Anthro., U. Miami, Coral Gables, FL 33124. Hypertension, awareness of it, and outcomes of traditional and modern treatments were samples 290 Caribbean-born residents of Miami, FL. The participants, aged 21-85, were resident in Miami 15.9 years on average, represent 17 different Caribbean countries. Demographic, blood pressure, and medical history data were collected. Age and BP were positively correlated but sex was not. BP above 140/90 was found in 23.5% of the sample. Mean systolic and diastolic values were lower than in most indigenous Caribbean populations. Caribbean-born individuals represent the gene pools of their natal countries, but they undergone major life changes in variables from drinking water, to occupation, to medical care and products. Caribbean immigrants in Miami regularly patronize ethnomedical practitioners and use traditional herbal remedies (65.2% of cases). They also use take advantage of modern biomedical health care facilities and drugs, thus allowing expanded treatment options.

11:15 AM BUSINESS MEETING: ANTHROPOLOGICAL SCIENCES
LINDA TAYLOR, presiding

ATMOSPHERIC AND OCEANOGRAPHIC SCIENCES

FRIDAY 8:30 a.m. – KEY WEST ROOM 218D
JOHN WINDSOR, FLORIDA INSTITUTE OF TECHNOLOGY, presiding

8:30 a.m. AOS-1 A study on water quality and its affect on *Halodule wrightii* in the north central segment of the Indian River Lagoon. A. MCKEE, E.A. IRLANDI, and J.G.WINDSOR. Dept. of Marine and Environmental Systems, Florida Institute of Technology, Melbourne, FL 32901. Water quality parameters such as salinity, temperature, dissolved oxygen, turbidity, total suspended solids, and nutrients all have effects on *Halodule wrightii* coverage, abundance, and health in the Indian River Lagoon. This study focuses on the effects of four creeks upon seagrass in the Indian River Lagoon: Crane Creek, Turkey Creek, Goat Creek, and Trout Creek. Seagrass was found to be healthier at sites located near Turkey and Goat Creek due to sufficient amount of light and nutrients reaching the plants. Seagrass near Crane and Turkey Creek were found to have poorer health due to high turbidity and high total suspended solids

8:45 a.m. AOS-2 A BACI study on the effects of the C-1 Canal Re-Diversion Project on benthic infauna. E.A. IRLANDI and S. HERBER. Dept. of Marine and Environmental Systems, Florida Institute of Technology, Melbourne, FL 32901. Before/After Control/Impact, or BACI, studies are broadly used to probe impacts on abundances of populations and community attributes due to anthropogenic alterations to natural systems. We have been collecting benthic samples on approximately a quarterly basis since February 2001 at three stations starting from the mouth and with increasing distance upstream from Turkey Creek, Crane Creek (impact creeks), Goat Creek, and Horse Creek (control creeks) prior to the C-1 canal re-diversion to evaluate the effects on benthic infauna. Faunal community attributes of species richness, evenness and diversity are being determined. Species composition and abundance prior to the diversion have been variable over space and time with no apparent trends associated with season, creek, or position within a creek detected as of yet.

9:00 a.m. AOS-3 Competitive interactions between *Halodule wrightii* and *Caulerpa prolifera*. E.A. IRLANDI, R. RAVES, M. REIBER, K. TAPLIN, and J. ROBERTS. Dept. of Marine and Environmental Systems, Florida Institute of Technology, Melbourne, FL 32901. General trends in abundance indicate that *Caulerpa prolifera* often occurs at depth while *Halodule wrightii* is more abundant in shallower areas. We have been conducting both field and mesocosm studies to investigate the influence of light on potential competitive interactions between the two species. *C. prolifera* produced more fronds and occurred at greater biomass at depth in the field and with reduced light levels in mesocosm experiments, whereas the opposite was true for *H. wrightii*. In addition *H. wrightii* does better at low light and at depth in the absence of *C. prolifera*

while *C. prolifera* showed no response to the presence or absence of *H. wrightii.*

9:15 a.m. AOS-4 An investigation of direct measurement methods to estimate groundwater nutrient loading to water bodies. M. REZNICEK and T.V. BELANGER. Dept. of Marine and Environmental Systems, Florida Institute of Technology, Melbourne, FL 32901. Several methods are typically used to determine groundwater nutrient loading into surface waters. Debate exists regarding the accuracy of the three direct sampling methods thought representative of groundwater seepage into water bodies. Water samples collected from onshore wells, seepage meter bags and in situ from the benthic sediments are currently all used, but are thought to yield different results upon nutrient analysis. The purpose of this study is to determine if these sampling techniques produce different loading measurements and to what extent. Additionally, differences in nutrient concentrations from wells at varying distances from shore and from in situ samples from increasing sediment depths will be addressed

9:30 a.m. BREAK

9:45 a.m. AOS-5 Characterizing total suspended solids and turbidity in Crane Creek, Melbourne, Florida. M. CHANSON and J.G. WINDSOR. Department of Marine and Environmental Systems, Florida Institute of Technology, 150 W. University Blvd, Melbourne, FL 32901. Crane Creek was dredged in 1998 and has since been monitored for water quality and sediment transport purposes. The objectives of this research are to determine 1) the spatial distribution of total suspended solids (TSS) and turbidity levels, 2) the seasonal variation of TSS and turbidity with a special focus on storm events, and 3) the factors affecting the relationship between TSS and turbidity

10:00 a.m. AOS-6 An analysis of current velocities, transport and water masses in the straits of Florida and Bahamas passages. A. MOULIN and G.A. MAUL. Dept. of Marine and Environmental Systems, Florida Institute of Technology, Melbourne, FL 32901. CTD casts were used to collect salinity, temperature and pressure data in the Straits of Florida and throughout the Bahamas. Velocities in the Straits of Florida are strong. Mean surface velocities varied from 0.60 m.s-1 to 1.23 m.s-1 and the associated transport varied from 9.59x106 m3.s-1 to 15.6x106 m3.s-1. Transport increases going northward through the Straits. The water masses showed a net stratification with four distinct layers. Just below the warm surface layer laid Subtropical Underwater (SUW) characterized by a salinity maximum between 50 and 200 m deep. Below the thermocline, Antarctic

Intermediate Water (AAIW) showed a salinity minimum between 700 and 850 m deep. The deepest stations possibly featured North Atlantic Deep Water (NADW) below the AAIW layer, emphasized by lower temperatures

10:15 a.m. AOS-7 Construction of an affordable, self-logging, and portable wave gauge. M.A. THOMPSON and E.D. THOSTESON. Dept. of Marine and Environmental Systems, Florida Institute of Technology, Melbourne, FL 32901. The challenge of constructing an affordable, self-logging, and portable wave gauge was presented to a group of students at the Florida Institute of Technology. The prototype rests on the seafloor and measures the pressure changes as waves pass overhead. Pressure sensor readings are amplified and relayed through pic microcontroller to a memory chip (flash RAM) and an LCD display, all powered by six AA batteries. The instrument housing was constructed from PVC. Pressure readings were converted to wave heights using calibration equations generated during pool tests. Wave height measurements on June 22nd at Melbourne Beach, Florida were approximately 3.06ft compared to nearest NOAA buoy values of 3.94ft. Instruments can be built that accurately measure and log wave height with a very minimal budget

10:30 a.m. AOS-8 Wave, weather and tide monitoring system at Sebastian Inlet, Florida. M. DAMON, N. SAMUELSON, and L.E. HARRIS. Dept. of Marine and Environmental Systems, Florida Institute of Technology, Melbourne, FL 32901. Oceanographic and meteorological data are critical to the understanding and management of a tidal inlet. This paper presents the wave, weather and tide data monitoring system operating at Sebastian Inlet, Florida since 1996. Summaries of the data collected over this six-year period including trends and extremes are included. Data collected by this system are analyzed with results and summaries presented in monthly and annual reports. This provides a better knowledge and understanding of the complex hydrodynamics, sediment transport, and effects of storm events at the inlet, which is utilized in the management of Sebastian Inlet

10:45 a.m. AOS-9 Variation in the nearshore reefs and the beach erosion/accretion in Indian River County, Florida. L.E. HARRIS, N. SAMUELSON and M. DAMON. Dept. of Marine and Environmental Systems, Florida Institute of Technology, Melbourne, FL 32901. Indian River County has the most extensive nearshore reef system in the State of Florida, with complex variations in the reef structure occurring along the shoreline. This paper presents the variations in the physical structure of the nearshore reefs from the Sebastian Inlet south to the Riomar Reef in Indian River County, Florida. The reef structure including the reef width, distance

offshore, reef heights and water depths were measured and compared to the historical erosion/accretion of the beaches in this area. The reef transect data for this study show that there are extensive reefs offshore that vary considerably in structure. Comparisons with beach profile change data show that there is a correlation between the nearshore reef structure and the accretion-erosion rates along the Indian River County shoreline

11:00 a.m. BREAK

11:15 a.m. AOS-10 The 2002 hurricane season. J.M. WILLIAMS. Dept. of Marine and Environmental Systems, Florida Institute of Technology, Melbourne, FL 32901. Although predicted to be normal the 2002 hurricane season included 12 named storms, with 4 hurricanes (2 intense/ major) and 14 tropical depressions. Isidore tracked through the Caribbean (peak winds 109 knots), made landfall in Yucatan and again in Louisiana. Lili, with a classic Cape Verde storm track, weakened to a tropical wave, struck Cuba as a Cat. 2, intensified to a Cat 4 in the Gulf of Mexico, quickly lost strength and struck Louisiana as a borderline Cat. 1/2 hurricane. Kyle was the 3rd longest running storm on record (22 days) in the Atlantic Basin, but was only a hurricane for a day. No storms developed in October for the 13th time in 50 years. The 8 named storms in September are a record for any month. The absence of the predicted El Nino may account for the "above-average" season and the presence of Saharan dust may have reduced the intensity of most of the storm systems this year

11:30 a.m. AOS-11 Future coastal populations. I.W. DUEDALL and G.A. MAUL. Dept. of Marine and Environmental Systems, Florida Institute of Technology, Melbourne, FL 32901. In 2000, 6 billion humans inhabited Earth, ~2.3 billion of whom (40%) lived within 100 km of the coast. By 2025, of the total world population (7.9 billion), 37% will live within 100 km of the coast. The largest concentration of humans will continue to be in Asia, where the largest percent increase of persons living within 100 km of the coast will occur. In 2000, the largest population per kilometer of coastline also was in Asia, but by 2025 more than 6000 persons per kilometer of coastline will be in the Middle East and North Africa region, followed by Asia and then by sub-Saharan Africa. Little to no changes are expected for Europe, North America, and Oceania. The 643 million more of us living within 100 km of the coastline by 2025 will tax the very small fraction of Earth's surface we consider home to more than 1/3rd of humankind but it is not an insurmountable challenge

11:45 a.m. AOS-12 An analysis of the International Maritime Organization-London Convention Annual Dumping Reports. C.B. DICKENSON, I.W. DUEDALL and M. SHEFFER. Dept. of Marine and Environmental Systems, Florida Institute of Technology, Melbourne, FL 32901. This paper analyzes trends in types and quantities of permitted wastes, primarily dredged material, sewage sludge, and industrial waste, to be dumped at sea by member countries to the London Convention over the period 1976 through 1998. In 1976 the first year of permitted dumping records of the combined amount of permitted wastes was approximately 38 million tons. In the last four years (1995 through 1998), the total amount of wastes permitted to be dumped by the LC contracting parties was 351,090,590 tons in 1995, 313,978,119 tons in 1996, 308,850,728 tons in 1997, and 335,908,329 tons in 1998. Currently a majority of these wastes are disposed of in the East Asian Seas and the North Sea. The largest quantity of waste is dredged material

12:00 p.m. BUSINESS MEETING: ATMOSPHERIC AND OCEANOGRAPHIC SCIENCES
JOHN WINDSOR, presiding

BIOLOGICAL SCIENCES

FRIDAY 8:30 a.m. – GARDEN KEY ROOM 221A
SESSION A
DAVID KARLEN, ENVIRONMENTAL PROTECTION COMMISSION OF HILLSBOROUGH COUNTY, presiding
VERTEBRATES

8:30 a.m. BIO-1 Effect of juvenile color and size on agonism by adults of two damselfishes (*Stegastes*). M.P. ROBINSON (1,2), J.M. MILLION (2,3), and S. MACIÁ (2). (1) Dept. Biol., Univ. Miami, Coral Gables, 33124, (2) Hofstra Univ. Marine Lab., PO Box 90, St. Ann's Bay, Jamaica, (3) ENITA de Bordeaux, BP 201, 33175 Gradignan, France. Many reef-dwelling fishes are more colorful as juveniles than as adults. To test one function of juvenile coloration, we presented territorial adults of two damselfishes, *Stegastes planifrons* and *S. dorsopunicans*, with wooden "intruder" models that independently expressed size and color. *Stegastes planifrons* demonstrated higher levels of agonism than *S. dorsopunicans*. Models of both species elicited significantly greater agonism when they were colored like adults, but agonism was independent of model size. These results support the hypothesis that these brightly colored juveniles

experience less agonism from conspecific adults, because the different color patterns disguise the juveniles so they are not recognized as competitors.

8:45 a.m. BIO-2 An assessment of the morphometric divergence between extralimital populations of Cane toads, *Bufo marinus*. K.G. SMITH. Department of Ecology and Evolutionary Biology, 569 Dabney Hall, The University of Tennessee, Knoxville, TN 37996-1610. The Florida population of the introduced toad, *B. marinus*, was studied for evidence of morphometric divergence from other extralimital populations of this species. Twenty-one morphometric characters were measured from museum specimens of toads from relevant populations. Multivariate statistical analyses, including principal components analysis and discriminant function analysis were used to determine the extent of the morphometric differentiation between and within populations over time. Possible interpretations of the results are discussed and the implications of these results to the fields of evolutionary biology, invasion biology, ecology, and conservation are considered.

9:00 a.m. BIO-3 Body condition factor analysis for the American alligator. C.L. ZWEIG (1), F.J. MAZZOTTI (1), K.G. RICE (2), L.A. BRANDT (3), and C.L. ABERCROMBIE (4). (1) Ft. Lauderdale Research and Education Center, 3205 College Ave., Ft. Lauderdale, FL 33314. (2) USGS, 3205 College Ave., Ft. Lauderdale, FL 33314. (3) A.R.M. Loxahatchee N.W.R., 10216 Lee Rd., Boynton Beach, FL 33437. (4) Wofford College, Campus P.O. Box 13, 429 Church St., Spartanburg, NC 29303. Condition indices have been used to analyze the fitness of animal populations for the last 50 years. However, the indices are complex and can be used inappropriately if unfamiliar with the constraints. For example, condition for crocodilians has been calculated numerous times using Relative K, developed for fisheries in 1952. Relative K is useful for comparing the condition of a population over time, but not appropriate for comparisons among populations. We analyzed morphometric measurements of the American alligator (*Alligator mississippiensis*) to determine which are measured most accurately and are appropriate for condition analyses. Head length, snout-vent length, tail girth and mass are suitable measurements for condition analyses. We then compared four condition indices and two models of volume/length relationships for their ability to distinguish between populations with known qualitative condition differences. A HL/Mass combination of Fulton's K is appropriate for a spatial comparison of populations, while an SVL/Mass combination of ANCOVA should be used for temporal comparisons.

9:15 a.m. BIO-4 Comparing relative rates and patterns of molecular evolution across genomes: evidence from mitochondrial and nuclear genes of lizards (Gymnophthalmidae). T.A. CASTOE. Univ. of Central Florida, 4000 Central Florida Blvd., Orlando, FL 32816. Comparing molecular evolution in organellar and nuclear genomes provides great potential insights into factors driving molecular evolution across genomes. Such investigations may examine covariant patterns of evolution across genomes and implicate common factors driving differential rates of evolution. Extremely few comparisons of rates and patterns of molecular evolution have been made between genomes across a large array of species. I used several techniques to examine covariance in nucleotide substitution rates among species and to contrast selective constraints and substitution models between genomes. Results are discussed based on their theoretical significance and their bearing on the use of multiple genomes simultaneously to recover estimates of phylogeny.

9:30 a.m. BIO-5 Genetic structure in *Rhineura floridana*. A. MULVANEY (1), K.G. ASHTON (2), K.L. KRYSKO (3) AND C.L. PARKINSON (1). (1) Dept. of Biology 4000 Central Florida Blvd., Orlando, FL 32816, (2) Archbold Biological Station 123 Main Drive, Venus, FL 33960, (3) Florida Museum of Natural History, Division of Herpetology, University of Florida, Gainesville, FL 32611. *Rhineura floridana*, the only extant member of Rhineuridae, is the only ampisbaneian native to the United States. *Rhineura* are fossorial, limbless squamates with reduced or absent pelvic and pectoral girdles. They are found in scrub, sand-hill, flatwood and hammock ecosystems and are not geographically uniform in morphology. Mitochondrial DNA was used to investigate genetic structure within R. floridana. Preliminary analysis indicates that there is geographic genetic structure among populations of *Rhineura*

9:45 a.m. BREAK

10:15 a.m. BIO-6 Broad-scale phylogenetic relationships among the advanced snakes (Colubroidea) inferred from mitochondrial DNA sequences. K.A. KENNEDY and C.L. PARKINSON. Univ. of Central Florida, 4000 Central Florida Pkwy, Orlando, FL 32816. Questions surrounding the evolutionary relationships among the major groups of colubroid snakes (colubrids, elapids, and viperids) have recently re-emerged, particularly regarding their respective monophyly. To clarify these deep relationships, phylogenies were inferred from mitochondrial cytochrome-b and small ribosomal subunit DNA sequences. Approximately 170 OTU's were analyzed using maximum parsimony and Bayesian phylogenetic methods. Results support the monophyly of the

Viperidae and Elapidae, and confirm paraphyly of the Colubridae with respect to all other members of Colubroidea. We discuss these results in a biogeographic context, and consider the evolutionary implications of the independent origin of a venom delivery apparatus in several lineages.

10:30 a.m. BIO-7 Sea turtle nutrient inputs to dune vegetation: a stable isotope analysis. L.B. PLOG, J.F. WEISHAMPEL, and J.D.ROTH. Dept. of Biology, UCF, Orlando, FL 32816. The east coast of Florida supports the world's third largest nesting population of *Caretta caretta* and the largest nesting population of *Chelonia mydas* in the continental US. To evaluate the contribution of nutrients from sea turtle eggs to dune vegetation, we measured stable-nitrogen isotope ratios (15N/14N) of turtle eggs and other marine sources and compared these to the ratios of four species of dune plants. We evaluated isotopic differences in the turtle eggs because 15N generally becomes enriched at higher trophic levels. Isotopic signatures of vegetation were expected to be inversely proportional to the distance from shore and were compared between areas of low and high sea turtle nest density. The results demonstrate if sea turtle nesting is a biogeochemical link between marine and terrestrial environments. Assistance was received from the FL Federation of Garden Clubs, Dr. L.M. Ehrhart and turtle crew.

10:45 a.m. BIO-8 Molecular phylogeny of the Sciuridae inferred from mitochondrial cytochrome-b sequences. M.D. HERRON, T.A. CASTOE, and C.L. PARKINSON. Univ. of Central Florida, 4000 Central Florida Pkwy, Orlando, FL 32816. The members of the rodent family Sciuridae display a wide range of ecological, life history and behavioral traits. In spite of the wide distribution and conspicuousness of this group, phylogenetic relationships remain poorly known. Establishment of a robust phylogeny for this group will facilitate a wide range of analyses addressing character evolution. Nucleotide sequence data from the mitochondrial cytochrome-b (cyt-b) gene were used to analyze phylogenetic relationships among sciurids. Complete and partial cyt-b gene sequences for 113 species in 18 genera were analyzed with maximum parsimony and Bayesian phylogenetic methods. We use the phylogeny to evaluate current sciurid taxonomy. We combine climatic, fossil, geologic and phylogenetic data to discuss the historical biogeography of this large, diverse group.

11:00 a.m. BIO-9 The functional significance of play fighting in polar bears: are they asocial? G.H. ECKHARDT, J.M. WATERMAN, and J.D. ROTH. Dept. Biol. Sci., Univ. of Central Florida. Polar bears are widely considered asocial animals. Yet while waiting for the sea ice to form near Churchill, Manitoba, male polar bears engage in play behavior

when temperatures start to cool in October and November. We collected detailed observational data in the fall of 2001 and 2002 to examine the functional significance of this play behavior. From tundra vehicles we recorded (a) body size, (b) use of space and (c) time budgets of individual bears, as well as (d) sizes of aggregations and (e) detailed components of male-male interactions. Play did include few aggressive components. Patterns of initiation of play fighting did not support self-assessment as a function of play, while patterns of termination did. Data suggested that males may form a dominance hierarchy on land during the fall season. Our data suggest that the play interactions that take place in the fall at Churchill could have an important influence on the spring mating season.

11:15 a.m. BIO-10 The influence of hormones and sexual swellings on social interactions in female mandrills (*Mandrillus sphinx*). R. SELLIN. Univ. of Central Florida, 4000 Central Florida Pkwy, Orlando, FL 32816. Old World Monkeys including mandrills have visual sexual swellings around ovulation. There is much debate in the literature as to the evolutionary advantage of sexual swellings. This study examines potential costs and benefits of sexual swellings in captive mandrills. It compares the hormone profiles of five females with their swelling profiles, and also compares affiliative and aggressive behaviors exhibited by other group members towards these females at different stages of their cycles. Behavioral data was collected using all-occurrence sampling and reproductive hormones were measured in urine using enzyme-immunoassays. Data supports that a linear hierarchy exists amongst females. The significance of these behavioral and hormonal patterns to female reproductive strategies will be discussed.

11:30 a.m. BUSINESS MEETING
DAVID KARLEN, ENVIRONMENTAL PROTECTION COMMISSION OF HILLSBOROUGH COUNTY, presiding

FRIDAY 9:00 a.m. – GARDEN KEY ROOM 221B
SESSION B
DANIEL MCCARTHY, SMITHSONIAN MARINE STATION AT FT. PIERCE, presiding
BOTANY

9:00 a.m. BIO-11 Seasonal ecology of drift algae in the Indian River Lagoon, FL. J.L. LISS (1), L.J. WALTERS (1), and K.S. BEACH (2). (1) Univ. of Central Florida, Dept. of Biology, Orlando, FL 32816, (2) Univ. of Tampa, Dept. of Biology, Tampa, FL 33606. To gain an

understanding of the ecology of drift algae in The Indian River Lagoon, we asked four questions: 1) What is the composition and rate of accumulation of drift? 2) Is there a difference in photosynthetic performance in drift versus attached algal species? 3) Do growth rates differ for drift versus attached algae? 4) Does drift undergo transport and turnover? Manipulative field and laboratory experiments were conducted to address these questions. To date, we have examined photosynthetic performance and growth in *Codium decorticatum* and *Gracilaria tikvahiae*. Changes in biomass and short-term physiology by electron transport rate (ETR) were used as indications of acclimation from an attached to drift state. In addition, seasonal composition, rate of accumulation, transport and turnover of naturally occurring drift have also been examined.

9:15 a.m. BIO-12 The wax and wane of cyanobacterial blooms in North-Central Florida Bay as discerned by pigment-based chemotaxonomy. J.W. LOUDA. Organic Geochemistry Group, Department of Chemistry and Biochemistry, Florida Atlantic University, 777 Glades Road, Boca Raton, FL 33431. Certain areas in North-Central Florida Bay have experienced recurrent cyanobacterial blooms for over a decade. Many hypotheses exist as to the onset, persistence and demise of these blooms. The present study was undertaken to evaluate the use of high performance liquid chromatography (HPLC) with full spectral photodiode array (PDA) analyses as an objective method with which to estimate community structure and biomass (viz. total chlorophyll-a). The cyanobacteria of North-Central Florida bay are exceedingly simple in their pigment complement. Specifically, the *Synechococcus* spp. dominating these blooms contain chlorophyll-a, b-carotene and the dihydroxy-b-carotene derivative zeaxanthin. Zeaxanthin, while found in low amounts in other taxa (e.g. Chlorophytes), is present in large amounts in many classes and families of the cyanobacteria and can therefore be used as 'biomarker' for the division. Examination of strong cyanobacterial blooms as well as pure algal cultures grown under various light levels has allowed us to establish a formula by which to estimate the taxonomic makeup of the phytoplankton communities in Florida Bay. Presently, it appears that these cyanobacterial blooms originate in or behind the mangrove transition zone of the northern bay and move out into the bay with fresh water flow and tidal flushing.

9:30 a.m. BIO-13 "Epiphytometry" in the study of epiphyte productivity and taxonomic makeup in North-Central Florida Bay. A. SINGH and J.W. LOUDA. Organic Geochemistry Group, Department of Chemistry and Biochemistry, Florida Atlantic University, 777 Glades Road, Boca Raton, FL 33431. Epiphytic communities consist of the bacteria, algal and animal life living on the submerged portions of aquatic

macrophytes. In the present case, we are studying the microalgal communities present on the leaves of turtle grass (*Thalassia testudinum*) in the Snake Bight and Whipray Basin areas of North-Central Florida Bay. These areas have been the sites of recurrent phytoplankton blooms and the present study is aimed at unraveling any similar effects within the microalgal epiphytic communities. Prior to answering that question however, a method with which to adequately investigate these communities was required. The present paper will detail the use of "epiphytometers", arrays of surrogate seagrass (Mylar), in order to address productivity. Specifically, the definition of time zero (to) is difficult to impossible with natural samples. Thus, Mylar strips, anchored to a concrete filled PVC frame and buoyed with closed cell Styrofoam, were tested at 3 sites in Florida Bay. Results reveal that "epiphytometry" is indeed a highly valuable method with which to assess productivity trends and, when pigments are analyzed by HPLC coupled to full spectral photodiode array (PDA) detection, the evaluation of community structure ('chemotaxonomy'), diatom dominated in these cases, is rather facile.

9:45 a.m. BIO-14 Pigment-based chemotaxonomic studies of Everglades periphyton. J.W. LOUDA (1), S. HAGERTHY (2), and P. MONGHKONSRI (1). (1) Organic Geochemistry Group, Department of Chemistry and Biochemistry, Florida Atlantic University, 777 Glades Road, Boca Raton, FL 33431, (2) South Florida Water Management District, 3301 Gun Club Road, West Palm Beach, FL 33406. Periphyton forms the bases of the food chain in the Everglades. As such, it is of utmost importance to that ecosystem and objective methods with which to monitor changes brought about by man, such as those to accompany the "restoration" efforts under the CERP initiative, are needed. Periphyton is a complex community comprised of algae, cyanobacteria, eubacteria, archaebacteria and a variety of heterotrophic consumers. At the base of this community, with respect to energy flow (~food), are the photoautotrophs, both oxygenic (cyanobacteria, algae) and anoxygenic (purple and green sulfur bacteria). The latter occur in microzones of anoxia and 'may' be involved in consortia which methylate mercury. The present effort is exploring the standardization of chemotaxonomy, the relation of taxon-specific biomarker pigments to total chlorophyll-a and bacterial chlorophylls, in the description of periphyton community structure. Analyses of pure cultures, grown under variant light regimes, and natural periphyton samples, from cyanobacterial- to chlorophyte-dominated communities, will be discussed as well as the pros and cons of the overall methodology.

10:00 a.m. BREAK

10:30 a.m. BIO-15 Impacts of post-fire nutrients on cattail expansion: the resilience and catastrophic shifts in the Florida Everglades ecosystem. Y. WU (1), S. NEWMAN (1), S. MIAO (1), K. RUTCHEY (1), N. WANG (1), F.H. SKLAR (1), and W.H. OREM (2). (1) South Florida Water Management District, 3301 Gun Club Road, West Palm Beach, FL 33406, (2) USGS, 12201 Sunrise Valley Drive, MS 956, Reston, VA 20192. The impact of fire on nutrient release and cattail expansion is a special concern for Everglades restoration. In April 1999, fire consumed 42,875 ha of northern Water Conservation Area 3A, in the central Everglades. In peat burned areas, cattail regrew at a rate of 1.079 (0.038) kg/m2, twice the rate of sawgrass. Cattail expansion and sawgrass regrowth rates were related to phosphorus concentrations in both the surface water and porewater in the top 10cm of soil. Post-fire average vegetation TP concentrations were 674 mg/kg in surface burn sawgrass, 344 in unburned sawgrass and 935 mg/kg in peat burn cattails. This research suggested that peat fires increase the expansion of cattails by creating openings in the landscape and through enhanced nutrient availability following fire mediated release.

10:45 a.m. BIO-16 Seed biology and reproductive phenology of dominant species on the Everglades tree islands: implications for tree island restoration S.L. MIAO and M. MANNA. South Florida Water Management District, 3301 Gun Club Road, West Palm Beach, FL 33406. Tree island restoration on an ecosystem scale relies on understanding key ecosystem processes and plant life history characteristics, such as seed biology, dispersal and reproductive phenology. The present study focused on forest recruitment using field observation and greenhouse experimentation to explore patterns of seed biology and reproductive phenology of dominant tree species in relation to hydrology and seed dispersal. Preliminary results showed that seed size, mineral content, and germination percentage among species varied greatly. Seeds of most species examined decayed rapidly (<2 months) after dispersal. Birds, particularly those that are migratory, consumed fruits of three of the six species studied. Consumption by birds reduced the length of seed dormancy and prolonged the duration of the germination period. These temporal effects may increase the opportunity of seeds encountering better conditions for germination, particularly in hydrologically-pulsed environments like the Everglades.

11:00 a.m. BIO-17 A comparison of tree cover in three Miami-Dade neighborhoods. W.E. HOPPER. Center for Urban Environmental Studies, Florida Memorial College, 15800 NW 42nd Avenue, Miami, FL 33054. Urban tree cover in unincorporated Miami-Dade County was estimated by American Forests in 1996 to be 10%, well below the 25% recommended for

urban areas. Historical aerial photographs of three residential neighborhoods in Miami-Dade County–Opa-locka, Bay Shore, and Hialeah–were analyzed to estimate the number of trees and the percent tree cover over a thirty-year time span. Changes in the number of trees and percent tree cover are discussed in relation to demographics, development, and disturbance events. This research was supported through a contract from the South Florida Water Management District.

11:15 a.m. BIO-18 Ecosystem services & sustainable development on the Caribbean Island of Dominica. L. LINES (1) and C. MILLER (2). (1) Department of Environmental Studies, Rollins College, (2) Department of Math and Science, St. Leo University. There is a growing literature aimed at identifying and evaluating the services to human societies provided by the world's natural ecosystems. These services encompass a wide range of processes including the purification of air and water, maintenance of soil fertility, and the protection of watersheds. For many developing countries, the services provided by natural ecosystems comprise a significant part of the overall national economy. This paper illuminates the role of ecosystem services in sustainable development using a case study (model) from the island of Dominica.

11:30 a.m. BUSINESS MEETING
DAVID KARLEN, ENVIRONMENTAL PROTECTION COMMISSIONOF HILLSBOROUGH COUNTY, presiding

FRIDAY 2:00 p.m. – GARDEN KEY ROOM 221A
SESSION C1-C2
DAVID KARLEN, ENVIRONMENTAL PROTECTION COMMISSION OF HILLSBOROUGH COUNTY & DANIEL MCCARTHY, SMITHSONIAN MARINE STATION AT FT. MYERS, co-presiding
INVERTEBRATES AND BIOMONITORING

2:00 p.m. BIO-19 Reproduction and life-history of the reef-building polychaete *Phragmatopoma lapidosa.* D.A. MCCARTHY Smithsonian Marine Station at Fort Pierce. The sabellariid polychaete *Phragmatopoma lapidosa* builds intertidal and shallow subtidal reefs on hard bottoms on the central to south east coast of Florida. The additional structure they provide is considered important in enhancing community diversity and abundance, as well as minimizing beach erosion. Despite this, little is known about reproductive periodicity, certain life-history traits or sources of mortality. From June 1997 to January 2000, I monitored settlement, mortality, and sublethal disturbance at intertidal and subtidal

sites while concurrently measuring the numbers and sizes of eggs in adult females. Intertidal recruitment peaked in the fall and subtidal recruitment peaked in the winter. During the fall and wintertime period, recruits covered more than 70% of all adult mounds in both habitats. Size and fecundity peaked during the summer. Individual worms grow rapidly, mature quickly and generally survive less than one year. All of these traits are characteristic of a weedy r-selected species. Thus, unlike conservation efforts that focus on factors that affect adults (i.e. human disturbance to corals), efforts to ensure the maintenance of healthy worm reefs, or to enhance colonization on artificial reefs, might best be directed towards factors that affect early life-history stages.

2:15 p.m. BIO-20 Recruitment of the oyster *Crassostrea virginica* on intertidal reefs in areas with intense boating activity in the Mosquito Lagoon, Florida. L.WALL and L. WALTERS. Dept. of Biology, Univ. of Central Florida, Orlando, FL 32816. Productivity, diversity and survival of estuaries are threatened by explosive coastal population growth and associated recreational activities. One major area of recreational growth has been the number of people motoring in small pleasure crafts at high rates of speed. In areas of Mosquito Lagoon with intense boating activity, intertidal reefs of *C. virginica* with dead margins commonly occur. The cause(s) of reef die-offs is unclear. However, the disarticulated shells may be reducing reef sustainability if these surfaces are unavailable for oyster recruitment. Recruitment trials were run on eight reefs (4 impacted, 4 non-impacted) in three eight-week trials in Summer 2001, Winter 2001-2002, and Spring 2002. New recruit survival, sediment loads, temperature and relative water motion were monitored at all sites. Significant differences were identified for seasonal effects for recruitment, survival and water motion.

2:30 p.m. BIO-21 Spatial orientation and modeling in the arboreal mangrove crab, *Aratus pisonii*. S.E. RHODES and S.L. GILCHRIST. New College of Florida, 5700 N. Tamiami Trail, Sarasota, FL 34243. Few studies have been conducted in the field or in the laboratory regarding the behavior of *Aratus pisonii*, an integral member of the mangrove swamp community. This crab inhabits *Rhizophora mangle*, *Avicennia germinans*, and *Laguncularia racemosa*, the red, white and black mangroves of Southern Florida. For this study, an extensive ethogram was established in the field and a behavioral time budget was ascertained. A pilot study combining both field and laboratory observations revealed the crabs' behavioral responses to two dimensional and three dimensional models of their predators and conspecifics. Predator models include; the blue crab, *Callinectes sapidus*, the yellow crowned night heron and the white heron. Models were sessile in the field and two were presented per trial. In the lab,

the models were manipulated to mimic the natural behaviors of predators and conspecifics.

2:45 p.m. BIO-22 Identification of the bacterial genus *Aeromonas* associated with the South Florida crayfish *Procambarus fallax*. C.W. YOUNCE. Palm Beach Atlantic University, West Palm Beach, FL 33416. This study looks at the association of the bacterium *Aeromonas* with the swamp crayfish, *Procambarus fallax*. In this study, bacteria were isolated from P. fallax head and tail samples through the use of ampicillin dextrin agar. The isolated bacteria from the ampicillin dextrin agar were then subjected to Gram stains and oxidase tests. Microscopy allowed for the examination of a rod morphology. Results suggested that at least two-thirds of the samples contained bacterial strands that met all tested criteria for the presence of *Aeromonas* spp. Thus, the data suggested that *Aeromonas* spp was present on the *P. fallax* that were tested, therefore allowing for a better insight into the study of bacterial associations with this crayfish species.

3:00 p.m. BIO-23 Thermal responses and the relationship to plant biomes in some South African cicadas (Homoptera: Cicadidae). P.K. PHILLIPS (1), A.F. SANBORN (2), and M.H. VILLET (3). (1) 17446 SW 33rd Ct., Miramar 33029, (2) Barry University, Miami Shores, FL 33161, (3) Rhodes University, Grahamstown 6140 South Africa. Thermal responses are measures of the abilities of the animals to adapt physiologically to their environment. The shade-seeking temperature (SST) was greatest for species inhabiting the thicket biome and lowest for species inhabiting the forest biome. The animals that live in the thicket biome may adapt to the greater thermal stress to take advantage of a habitat that permits lower predation pressure. There is a correlation between body size and SST with smaller species exhibiting lower thermal responses in a particular habitat. This may be related to the greater heat exchange in smaller species. Heat torpor temperatures did not differ between the various biomes. Comparisons to North American species show similar responses in similar habitats. AFS was supported by a Wilkowski Fellowship at BU.

3:15 p.m. BIO-24 Asexual reproduction via fragmentation of the bryozoan *Zoobotryon verticillatum*. N.M. ROBINSON and L.J. WALTERS. Dept. of Biology, Univ. of Central FL. In the Indian River Lagoon, the abundance of drift and attached *Z. verticillatum* varies greatly throughout the year. Peak recruitment is seen in May and August with a latent period from November through April. To better understand asexual reproduction of this invertebrate, we examined: 1) the probability that small fragments of *Z. verticillatum* could attach to hard surfaces after being separated from the parent colony and 2) the correlation between fragment

size and attachment success. Replicate fragments of specific sizes (10-50 mm) were placed in plastic boxes in the Lagoon. The boxes were removed after allotted time intervals and fragments were recorded as: 1) attached, 2) not attached, or 3) dead. We found a low percentage of attachment after 4 hours (<10%) and intermediate attachment after 12 hours (27%). However, when left undisturbed for 24 hours, 73% of the fragments attached. In all trials, the largest size classes were the most successful.

3:30 p.m. BREAK

3:45 p.m. BIO-25 Planktonic juveniles of the Florida estuarine brittlestar from the Indian River Lagoon System. R.L. TURNER (1) and E.A. REYIER (1,2). (1) Dept. Biol. Sci., Fla. Inst. Technol., 150 W. University Blvd., Melbourne, FL 32901, (2) Dynamac Corp., Mail Code Dyn-2, Kennedy Space Center, FL 32899. Low densities of planktonic juveniles of the Florida estuarine brittlestar *Ophiophragmus filograneus* are being taken in the northern Indian River Lagoon System by neuston net. The juveniles have disc diameters of ~0.5 mm and only a few arm segments; larger ones already display the 2 + 3 arm pattern of differential arm growth. Morphology and coloration are typical for juvenile O. filograneus. Juveniles are accompanied by mucous sacs that might represent a secretion for planktonic life or a modified pluteus or vitellaria larva. Although benthic juveniles have been found in the past, earlier developmental stages have not been described. The presence of planktonic juveniles suggests the existence of a pelagic larva or embryonic phase in its life history rather than abbreviated benthic development as an adaptation to estuarine life.

4:00 p.m. BIO-26 Importance of habitat for growth and reproduction of sea urchins. S. MACIÁ (1,2). (1) Hofstra University Marine Lab, Jamaica, (2) Barry University, Miami Shores, FL 33161. The sea urchin *Tripneustes ventricosus* is an economically and ecologically important grazer found in various habitats throughout the Caribbean. I compared the test diameter and gonad index of *T. ventricosus* in coral reef and seagrass habitats in St. Ann's Bay, Jamaica. Size of urchins on the reef was significantly larger than that of urchins in the seagrass, but there was no difference in gonad index between the two populations. Urchins maintained under laboratory conditions and fed macroalgae had a significantly higher growth rate than urchins fed seagrass, suggesting that the size differences observed in the field populations could be a result of diet. In recent years, macroalgal cover on Caribbean reefs has increased and coral cover has decreased. Enhanced growth of sea urchins in reef habitats may help control this overgrowth of algae.

4:15 p.m. BIO-27 Use of brine shrimp (*Artemia franciscana*) to assay LD_{50} toxicity of formaldehyde. S. DICK and J.R. MONTAGUE. Barry University, Miami Shores, FL 33161. In a study presented at Florida Academy of Sciences 2002, we reported an unusual treatment response by brine shrimp (A. franciscana) to formaldehyde in a study of toxicity. The 2002 study indicated that control brine shrimp (unexposed to formaldehyde) suffered significantly higher mortality in 3.026% seawater than in 3.400% seawater (50% mortality vs. 25% mortality, respectively). The 3.026% seawater treatment mortality was also significantly higher than the 20% mortality in 3.026% seawater + 0.0001 ppm formaldehyde). To test the hypothesis that volatile formaldehyde vapors had created this mortality artifact, we repeated the experiments in late 2002 with a new spatial arrangement of sample treatment wells. Our new results suggest that the earlier 2002 control mortality data had been skewed by the artifact of volatile formaldehyde vapor. (Supported by NIH-MARC-USTAR Grant to Barry University).

4:30 p.m. BIO-28 TMDL bioassessment using benthic macro-invertebrates in Lake Jesup and Lake Seminary, Seminole County, Florida. G. EBY and J.A. OSBORNE. Biology Department, University of Central Florida, P.O. Box 25000, Orlando, FL 32816. The objective of this study was to obtain a bioassessment using benthic macroinvertebrates to establish the TMDL (Total Maximum Daily Load) criteria for an oligotrophic (Lake Seminary) and a eutrophic (Lake Jesup) freshwater system in Seminole County, Florida. Monthly sampling of the benthic macroinverterbrate communities provided important biological data necessary to construct TMDL protocol and trophic state. Since macroinvertebrates are near the base of the food chain, they not only provide a critical role in the natural flow of energy and nutrients through the food web, but also provide a good indication of water quality by their presence and abundance. Our study suggests that TMDL protocol and reversal trends in eutrophication can be successfully monitored using benthic macroinvertebrate data.

4:45 p.m. BIO-29 Benthic community status of Hillsborough Bay: 1993-1998. D.J. KARLEN, S.A. GRABE, C.M. HOLDEN, B. GOETTING, and T. DIX. Environmental Protection Commission of Hillsborough County, 1410 N. 21st Street, Tampa, FL 33605. This presentation summarizes data collected from the Hillsborough Bay segment of Tampa Bay from 1993-1998 as part of an ongoing benthic monitoring program. Samples were collected annually in late summer/early fall from randomly generated station coordinates, with a total of 139 sites sampled cumulatively (19-29 sites/year). Sediment samples were taken using a Young modified Van Veen grab sampler, and samples were collected for benthic community

measures (species composition, species richness, density, diversity, evenness, Benthic Index); percent silt+clay, and sediment contaminants (heavy metals, organics, pesticides) analysis. Surface and bottom hydrographic parameters (temperature, salinity, pH, dissolved oxygen) were also recorded at each sampling site. Hydrographic measures and benthic faunal structure varied from year to year, however data analysis failed to show a strong link between these two factors.

POSTERS: BIOLOGICAL SCIENCES

STUDENT UNION 302, FRIDAY 8:00 a.m. – 4:00 p.m.

POS-1 Declining intertidal oyster reefs in Florida: direct and indirect impacts of boat wakes. L. WALTERS, P. SACKS, L. WALL, J. GREVERT, D. LEJEUNE, S. FISCHER, and A. SIMPSON. Dept. of Biology, Univ. of Central Florida, Orlando, FL 32816. Numerous intertidal reefs of the eastern oyster *Crassostrea virginica* have dramatically declined over the past 50 years along the east coast of central Florida. Many reefs are significantly smaller than in the past and have large dead margins on their seaward edges. It is hypothesized that these differences are due to increased recreational boating activity. To better understand the impact of boating on intertidal oyster reefs, we have begun to run replicated field trials in Mosquito Lagoon that include a motorboat passing a reef at one of three speeds (5, 10, 20 mph), one of three distances from shore (15, 30, 45 m) and one of two propeller angles (45 and 90 degrees). On shore, observers recorded dislodgment of shells, flow rates, wake height, wind speed, propagation time, and turbidity. With the present configuration, all three variables had a significant impact on the oyster reef.

POS-2 Distribution and abundance of the Mole crab *Emerita talpoida* and the Coquina clam *Donax variabilis* in St. Johns County. D. LEJEUNE, L. WALTERS, and R. SPENCE. Biology, UCF, Orlando, FL 32816. Little is known about the current abundance and distribution of the Mole crab *Emerita talpoida* and Coquina clam *Donax variabilis* throughout the beaches of St. Johns County (northeast FL). St. Johns County is one of the few counties in the state of Florida that allows beach driving. It is hypothesized that beach driving and sand grain size may play important roles in the distribution and abundance of the Mole crab and Coquina clam. To test this hypothesis four beach categories were sampled: 1) Fine grain with beach driving, 2) Fine grain without beach driving, 3) Course grain with beach driving, and 4) Course grain without beach driving. The abundance of both species was impacted by both beach driving and sand grain size; the greatest abundances for *E. talpoida* and *D. variabilis* occurred on non-driving beaches with course grain sand.

POS-3 Soil fungi and fire ant mound abandonment. J.N. BACICH, K.S. VEDDA, and J.A. ZETTLER. Dept. of Biology, Armstrong Atlantic State Univ., Savannah, GA 31419. The red imported fire ant, *Solenopsis invicta*, is an invasive species that causes both ecological and economic damage. Several methods have been employed to prevent their spread. Ants ward off microbiota through chemical and physical defenses. Thus, we tried to determine if fire ants abandon their mounds in response to fungal population explosions. Once weekly, we took soil samples from 10 fire ant mounds to determine if ant movement is correlated with high fungal populations. In addition, we inoculated mounds with *Rhizopus stolonifer* and *Penicillium janthinellum* because *P. janthinellum* is commonly found in fire ant mounds, whereas *R. stolonifer* is a common soil fungus not found in mounds. In preliminary experiments, we determined that fungal abundance appears to be related to fire ant mound abandonment.

POS-4 Cryptic responses of rainwater killifish (*Lucania parva*) to changes in background color. K. JACOBI and K.A. WORK. Stetson University, DeLand, FL. This experiment tested whether rainwater killifish (*Lucania parva*) could change their pigmentation to match any of three background colors. Nine 5-gallon fish tanks were surrounded with either white, green, or brown paper and filled with the appropriate color of gravel. At the beginning of each experiment, five fish were released into each tank and their initial color was recorded. The fish were observed for color change for 48 hours. Four trials of this experiment were performed and at the end of the fourth trial, one bluegill (*Lepomis machrochirus*) was suspended in each tank in a ziplock bag. The fish were observed again for color change. In each trial, the killifish in all treatments blanched when they were released into the tank. Within ½ hour after their release into the tank, the fish in the green and brown treatments darkened to match the background, whereas the fish in the white treatment remained virtually white. However, after 24 hours the fish in the green and brown treatments began to lighten. When the bluegills were suspended in the tanks, the fish in the green and brown tanks darkened again initially, but lightened as they became acclimatized to the presence of the bluegills. These results suggest that rainwater killifish (*L. parva*) can alter their coloration in response to background color and that the function of this response is to reduce vulnerability to predation.

POS-5 Fish community dynamics in Volusia Blue Spring. M.A. GIBBS and K.A. WORK. Dept. Biology, Stetson Univ., DeLand, FL 32723. We examined the seasonal variation in fish community composition along Volusia Blue Spring run. Fish were counted and identified from 3 seines at each of 5 sampling stations along the spring run on a monthly

basis. During the 2 years of this study, a strong dissolved oxygen (DO) gradient was measured and found to have a strong positive correlation with fish diversity. Interestingly, in individual microhabitats along the spring run, where most small fish were found, similar ranges in DO were measured seasonally. Fish that are especially tolerant of low DO levels were dominant in the upper reaches of the spring run throughout the year. Not suprisingly, *Gambusia* dominated all sites throughout the year. In the middle and lower reaches of the spring run, however, numbers of other species (*Lucania parva*, *L. goodei*, *Heterandria formosa*) not only increased (as expected), but also exhibited regular seasonal variation.

POS-6 The role of thermal contrast in infrared-based predatory targeting by Crotaline snakes. J.U. VAN DYKE and M.S. GRACE. Florida Tech, 150 W. University Blvd., Melbourne, FL 32901. Crotaline snakes (*e.g.* rattlesnakes) simultaneously image their environments using visible light via eyes and infrared (IR) radiation via facial pit organs. Like the visual system, the IR system likely operates on the basis of contrast (here, contrast refers to differential IR emission from thermally contrasting objects), but this hypothesis has never been tested directly. We behaviorally tested the ability of copperheads (*Agkistrodon contortrix*) and pigmy rattlesnakes (*Sistrurus miliarius*) to detect IR differentials that represented either (1) positive (artificial target warmer than background), (2) negative, or (3) zero thermal differentials. Our results show that IR imaging snakes can detect both positive and negative differentials and that response declines as differentials approach zero. These results suggest that the neural mechanisms of visual and IR contrast detection are similar.

POS-7 Evolution, organization, and distribution of infrared imaging systems in boid Snakes. A.B. SAFER, J. VAN DYKE, and M.S. GRACE. Florida Tech, 150 W. University Blvd., Melbourne, FL 32901. Unlike the infrared (IR) imaging pit vipers, boid snakes possess great interspecific variation in the number and arrangement of IR sensing pit organs. The presence of pit organs in boids is generally considered a derived trait, but some IR imaging boids do not possess pit organs at all. We report a comprehensive review of the literature and sort evidence of IR sensitivity into three categories: anatomical, electrophysiological, and behavioral. We show that IR imaging has been tested in only a few boid species, and that the most basal boid snakes (those lacking pit organs) have not been tested for IR imaging capability. If these basal members prove to be IR imaging species, it seems likely that while the presence of pit organs may be a derived trait in boids, IR imaging itself may be a shared common ancestral trait.

POS-8 Changes in lipid composition of Killer whale (*Orcinus orca)* skin and blubber. A.M. SAMUEL (1), G.A.J. WORTHY (1), and T.A.M. WORTHY (1). (1) Dept. of Biology, 4000 Central Florida Blvd., Orlando, FL 32816-2368. The purpose of this study was to examine the composition of killer whale skin and blubber as a function of depth, with the goal of applying this information to better understand the feeding ecology of this species. Skin and blubber (subdivided into six equal depths) from dead killer whales were analyzed for fatty acid composition, gross lipid content, and lipid classes. Statistical analyses indicated that fatty acid composition changes significantly with blubber depth, while gross lipid content initially increased, then remained relatively stable with increasing depth. Dietary fats could potentially be deposited into each layer to fulfill specific functions, complicating the analysis of blubber in reference to diet. Ultimately, it may be feasible to relate changes in lipid content and fatty acid composition to conductivity and insulative quality.

POS-9 An ecological assessment of the Caples Stormwater Detention Pond. S.A. MAY. New College of Florida, 5700 N. Tamiami Tr., Sarasota, FL 34243. An ecological assessment was performed on a Florida stormwater detention pond. A catalogue of plant and animal life was created. Plant life was randomly sampled using a $1m^2$ grid. Vertebrate populations, and their behaviors, were recorded. Aquatic macroinvertebrates were sampled along a transect at varying depths using a plankton net. Invertebrates were sorted by morphological distinctions and a measure of diversity was determined using Cairns' Sequential Comparison Index. In addition, water samples were tested for levels of dissolved oxygen, temperature, pH, nitrate and phosphate, cyanide, chromium and copper. The ecology of the pond in an unmanaged situation is compared to a highly managed situation, including removal of plant growth and the addition of copper sulfate for algae control. Using the compiled data, ecologically sound techniques for future pond management are suggested.

COMPUTER/MATHEMATICAL SCIENCES

FRIDAY 8:30 a.m. – KEY WEST ROOM 218B
SIAMACK BONDARI, SAINT LEO UNIVERSITY, presiding

8:30 a.m. CMS-1 Alternative delivery systems for mathematical content, part I. J.A. WHITE. Saint Leo University, Saint Leo, FL 33574. Blackboard will be demonstrated as a way to supplement traditional mathematical instruction. Discussion boards will be used to increase class discussion; quizzes will be delivered to save class time on low level

assessment; course content will be demonstrated for easy student access; and a web based record book will be used to allow students to track their scores and grade.

8:45 a.m. CMS-2 Alternative delivery systems for mathematical content, part II. S. BONDARI. Saint Leo University, Saint Leo, FL 33574. The online version of Introduction to Elementary Statistics was developed at Saint Leo University and is offered in 8-week terms through the University Alliance. There are five exams and two projects and students are required to post their assignments on the message board on the weekly basis. The randomized testing with large test banks is used to reduce the possibility of academic dishonesty. Other than the message board the chat room and email are utilized as the main tools of communication.

9:00 a.m. CMS-3 Prodding Twentieth Century faculty toward Twenty First Century technology: a lesson in what not to do. R.R. CRISS. Saint Leo University, Saint Leo, FL 33574. Saint Leo University has joined other colleges and universities in recent attempts to place active learning strategies into courses across the curriculum. Coupled with this attempt has been a push to place technology and the internet into classrooms. This paper outlines some of challenges that arise as an institution advances active learning and technology in its classrooms. We also offer some strategies for overcoming necessary difficulties, avoiding unnecessary difficulties, and distinguishing between the two.

9:15 a.m. CMS-4 Constructing quantitative models in the classroom. C. MILLER. Saint Leo University, Saint Leo, FL 33574. The goal of science is the prediction and understanding of the world; models are abstract simplified views of this world and therefore allow us to grasp the complexity of the universe. Quantitative models can students understand cause-and-effect relationships by applying mathematics to many different questions. In this talk, I examine how educators might using models and modeling software in helping students understand the world and help make predictions about the world. I will discuss how modeling may be used in a variety of classroom settings, from Physics to Ecology and how math educators can especially facilitate this in an interdisciplinary context. Finally, we will look at some examples of models that have built in several ecology classes I have taught.
9:30 a.m. BREAK

9:45 a.m. CMS-5 When does the sequence K*2N+1 contain only composite numbers? A. AKPAULOU. Barry University, Miami Shores, FL 33161. In this talk, we look at the sequence k*2n+1 for n =1,2… . These

numbers are not always composite. We would like to determine the value of k so that this sequence consists of only composite numbers. The investigation involved looking at some patterns of these numbers using MAPLE. There were several regularities that were noticed and then we have a proof of some of these regular patterns.

10:00 a.m. CMS-6 Numbers that are simultaneously sums of two cubes and also sums of two squares. S. ZIVANOVIC. Barry University, Miami Shores, FL 33161. Problems of the type when can a number be expressed as a sum of two cubes have been studied in number theory many times. In this paper, we investigate the problem of when a number can be expressed simultaneously both as a sum of two cubes and also as a sum of two squares. We want to present some patterns that were observed for such numbers along with some proofs.

10:15 a.m. CMS-7 Composite numbers in arithmetical progressions. H. ZENELAJ and S.-Y. WONG. Barry University, Miami Shores, FL 33161. The theorem of Dirichlet states that in any arithmetic progression {an+b} where (a,b) = 1, there are infinitely many primes. The present problem is to look for patterns in the composite numbers that are in this progression. We are looking at the sequence {4n+1} and there are some regular patterns associated with the composite numbers in that sequence.

10:30 a.m. CMS-8 A problem of projectiles combined with simple harmonic motion. C. WILLY. Barry University, Miami Shores, FL 33161. When a gun is fired from a ship at sea, the problem of projectiles becomes more complicated because of the motion of the ship from side to side. Assuming that this motion is in the form of a simple harmonic motion, this problem tries to investigate how the gunfire is affected.

10:45 a.m. BREAK

11:00 a.m. CMS-9 Some uses of mathematical induction in geometry. M.S. JAGADISH. Barry University, Miami Shores, FL 33161. Most of the times, the examples of induction given in classes are of an algebraic nature. Very few problems of geometry where induction is used are even mentioned in the class. However, there are many interesting geometrical problems that need an inductive proof. Some examples are the generalizations of the Euler circle to polygons and the properties of the Simpson line of a triangle that can be generalized to polygons. This talk proposes to give proofs of the above generalizations and indicate other examples of the same kind.

11:15 a.m. CMS-10 A primal-dual interior-point method for linear and semidefinite programming. J.N. SINGH. Dept. of Mathematics and Computer Science, Barry University, Miami Shores, FL 33161. In this paper we develop a primal-dual interior-point method for linear and semidefinite programming, based on a non-logarithmic barrier function. Keywords: Interior-point method, Primal-dual method, Central path, Polynomial Complexity. Mathematics Subject Classification: 90C05.

11:30 a.m. CMS-11 Web services: a snapshot. C. CHRAIBI. Barry University, Miami Shores, FL 33161. The processing, exchange, and integration of the enormous amount of information on the World Wide Web has led to the development of powerful Web applications, referred to as Web services, which are at the foundation of a swift change of paradigm in software development and deployment. Web services are XML-based components that are language, platform and location independent. They are self-contained, self-describing, modular applications that can be published, located and invoked across the Web. They are becoming the major components for the creation and integration of large-scale distributed systems. An overview of web services and their effect on distributed computing is provided. Associated enabling technologies and frameworks are discussed and analyzed.

11:45 a.m. CMS-12 Forecasting electric load using an auto enhanced functional link network based on GA optimization. H.P. SATPATHY. Barry University, Miami Shores, Florida 33161. This paper presents a new functional-link network based short-term electric load forecasting system using genetic algorithm (GA). The load and weather parameters are modeled as a nonlinear ARMA process and parameters of this model are obtained using the functional approximation capabilities of an auto-enhanced Functional Link net. The adaptive mechanism with a nonlinear learning rule is used to train the link network on-line. Then the link weights are further optimized using GA. The results indicate that the functional link net based load forecasting system produces robust and more accurate load forecasts in comparison to simple adaptive neural network or statistical based approaches. Testing the algorithm with load and weather data for a period of two years reveals satisfactory performance with mean absolute percentage error (MAPE) mostly less than 2% for a 24-hour ahead forecast and less than 2.5% for a 168-hour ahead forecast.

12:00 p.m. BUSINESS MEETING: COMPUTER & MATHEMATICAL SCIENCES
SIAMACK BONDARI, presiding

ENVIRONMENTAL CHEMISTRY AND CHEMICAL SCIENCES

FRIDAY 8:00 a.m. – CEDAR KEY BOARD ROOM 223
SESSION A
CHERIE GEIGER, UCF, presiding

8:00 a.m. ENV-1 Development of new growth factors for petroleum degrading marine bacteria. R. KINKADE (1), S. NASER (2), and O. PHANSTIEL IV (1). (1) Department of Chemistry, (2) Department of Molecular and Microbiology, University of Central Florida, Orlando, FL 32816. Marine bacteria produce low-molecular weight compounds (siderophores) to sequester iron from their environment Iron is an essential element necessary for growth. By facilitating the acquisition of this crucial element, one maybe able to increase growth rates of oil-eating bacteria. A panel of siderophores was synthesized for determining the best growth stimulant. After comparing the growth curves of 7 siderophores with the standard growth curve of *Marinobacter hydrocarbonoclasticus* and its native chelator (petrobactin), we were able to develop a structure – activity relationship for these new bacterial growth factors.

8:15 a.m. ENV-2 A study of the effects of mechanical alloying conditions on hydrogen interaction characteristics of mixtures of titanium, magnesium and nickel. J. GILBERT, M. FRANJIC, M. HAMPTON, and L. GIANNUZZI. Department of Chemistry, University of Central Florida, 4000 Central Florida Boulevard, Orlando, FL 32816. The effect of mechanical alloying conditions on hydrogen interaction characteristics of mechanically alloyed mixtures of titanium, magnesium, and nickel, were studied. Materials were produced that absorbed moderate amounts of hydrogen with reasonable hydriding onset temperatures. The hydrogen interaction properties of the mechanically alloyed TiMgNi mixtures were determined using differential scanning calorimetry. The relationship between hydrogen interaction characteristics and mechanical alloying conditions will be discussed.

8:30 a.m. ENV-3 Preparation of 9,9-cyanoethyl-2,7-bis-diphenyl-aminofluorene for application in two photon dye research. K.D. BELFIELD, A. BRICE, and S. YAO. Department of Chemistry, University of Central Florida, P.O. Box 162366, Orlando, FL 32816. 9,9-cyanoethyl-2,7-bis-diphenylaminofluorene was synthesized and characterized in a two step synthesis. The first step was the reaction of 2,7-dibromofluorene with diphenylamine. The product was 2,7-diphenylaminofluorene. The second step included a reaction of the 2,7-diphenylaminofluorene reacting with acrylonitrile. The product was 9,9-cyanoethyl-2,7-bis-diphenylamino-

fluorene. Thin-layer-chromatography and HNMR characterized the products.

8:45 a.m. ENV-4 Preparation of a functionalized monomer for incorporation into a hydrogel filter. K.D. BELFIELD, P. ARMSTRONG, and S. YAO. Department of Chemistry, University of Central Florida P.O. Box 162366, Orlando, FL 32816. Synthesis and characterization of a novel monomer was necessary to enable antibody affinity to a common hydrogel. The placement of a stationary antibody on the hydrogel allows for immediate quantification of biological warfare agents without resorting to the longer procedures used today. The hydrogel was then placed in a water filtration system in order to detect and quantify biological warfare agents via fluorescent probes. This process is due to the solvatochromic effect of the dye which arises from the antibody-antigen interaction.

9:00 a.m. ENV-5 Novel calamitic liquid crystals: synthesis and characterization. M. QADDOURA and K. BELFIELD. Department of Chemistry, University of Central Florida, P.O. Box 162366, Orlando, Fl 32816. Several divinylic mesogenic monomers were synthesized based on coupling the monomer 4(n-pent-4-enyloxy) benzoic acid with 2,5 dihydroxy acetophenone, 2-methoxy hydroquinone, methylhydroquinone, or chlorohydroquinone. This resulted in obtaining novel mesogens of phenylene esters with different lateral substituents groups.The effect of the lateral substituents groups on the thermotropic behavior was investigated using DSC and Optical Polarized Microscopy. All the mesogens proved to have a wide nematic range, while only the phenylene ester, which has methoxy lateral substituents, exhibited both nematic and smectic phases.

9:15 a.m. ENV-6 Dechlorination of polychlorinated biphenyls in solution by Pd/Fe bimetallic emulsions. L.B. FILIPEK (1), C. CLAUSEN COON (1), C.L. GEIGER (1), C.A. CLAUSEN (1), J. QUINN (2), and R. DEVOR (1). (1) Department of Chemistry, University of Central Florida 4000 Central Florida Blvd., Orlando 32816, (2) NASA Kennedy Space Center Mail stop YA-C3-C KSC, FL 32899. Research conducted at the Industrial and Environmental Chemistry labs at the University Central Florida demonstrated the feasibility of using emulsions containing bimetallic particles to dechlorinate PCBs in soils. Research has indicated bimetallic particles of PD/Fe dehalogenate polychlorinated biphenyls in solution. A series of kinetic studies were carried out to compare the rate of dehalogenation of the neat bimetallic particle and the emulsions. A number of emulsion configurations were tested for their ability to dehalogenate PCBs and for their ability to stay stable in solution over an extended period of time. It was demonstrated that PCBs diffuse through the membrane of the

emulsion droplet where it reaches the surface of the bimetallic particle in the interior aqueous phase and dehalogenation takes place. The dehalogenation reaction byproduct is biphenyl.

9:30 a.m. ENV-7 Manganese (II) oxide for hydrogen gas detection. D. CAUCEGLIA, M.D. HAMPTON, and J.K. LOMNESS. Department of Chemistry, University of Central Florida, Orlando, FL 32816. The reaction of manganese (II) oxide with hydrogen results in the reduction of the manganese along with the release of water and heat. The utility of this reaction for hydrogen detection has been studied using the compound in the form of films and pellets interfaced with quartz crystal microbalances and with SETARAM heat sensing chips. The films were produced by electrochemical and wet chemical methods and the pellets were produced mechanically. The responses of these sensors will be discussed.

9:45 a.m. ENV-8 Oxidation of b-amino esters to n-hydroxy-b-amino esters. R.D. PALUSAK, AND P. PIGNON, and O. PHANSTIEL IV. Center for Drug Discovery and Diagnostics, Dept. of Chemistry, Univ. of Central Florida, Orlando, FL 32816-2366. N-hydroxy amides (RCON(OH)R') have been shown to possess a variety of biological activities. Two new methods were developed to oxidize a series of b-amino esters to their corresponding N-hydroxy counterparts using either OXONE or Benzoyl Peroxide (BPO). In the OXONE reactions, a series of different buffer systems were evaluated. Surprisingly, the best yield (41%) was obtained in a non-buffered aqueous solution. The optimal BPO method was obtained using a pH 10.5 buffer and CH2Cl2. Typical yields were 50%. IR spectroscopy was used to study the hydrogen bonding scheme of these new N-hydroxy amide ester motifs in hopes of understanding how these structures may perturb protein structure.

10:00 a.m. BREAK

10:15 a.m.ENV-9 Effect of spectral regions on the growth of duckweed, *Lemna minor*. L. ANDERSON, C.A. BOWE, and D.F. MARTIN. Institute for Environmental Studies, Department of Chemistry, University of South Florida, 4202 East Fowler Avenue, Tampa, FL 32620. Plants respond to light depending on the intensity, duration, and wavelength of the light received. Previous laboratory experiments have shown that the photosynthesis process that takes place in plants when submitted to intense light has a very different spectral response than the human eye. This study measured the growth of *Lemna minor* under regulated conditions of light by three specific intensities originated from blue, green, and red colored plastic

panels. We used conventional illumination (12 hours light, 12 dark) and controlled environmental conditions in this research on duckweed.

10:30 a.m. ENV-10 Computer simulation of water simulation by reverse osmosis. B. CORLAY (1), J. HAKY (1) and A. ZILOUCHIAN (2). (1) Department of Chemistry and Biochemistry, Florida Atlantic University, Boca Raton, FL 33431, (2) Department of Electrical Engineering, Florida Atlantic University, Boca Raton, FL 33431. We are involved in simulating the chemical pre-treatment of seawater in a reverse osmosis desalination plant. A computer model of this process was created using the Labview® programming language. The first part of this project, which is presented here, consists of modeling the controlling devices and determining the effects of a variety of operating conditions, such as pH and temperature, on the reverse osmosis system. Ultimately, it will be linked to sensors and other devices for the actual remote operation of the plant.

10:45 a.m. ENV-11 Phosphate and nitrate uptake and growth of duckweed, *Lemna minor*. M. MCKENZIE (1), C. BOWE (1), D.P. SMITH (2), and D.F. MARTIN (1). (1) Institute for Environmental Studies, Dept. Chem., (2) Department of Civil Engineering, University of South Florida, 4202 East Fowler Avenue, Tampa, Fl 33620. Duckweed is abundant in Florida and has been viewed as a potential green chemistry method for cleaning wastewater. Duckweed is a very fast growing aquatic plant, which can overrun run-off waterways, however it is an effective tool to remove phosphates, nitrates, ammonia, and heavy metals from solution. This study focuses on the health of the duckweed in a log growth phase and measuring the phosphate and chlorophyll concentration of the plant. The tests on duckweed were conducted using plastic reactors at controlled by peristaltic pumps in a controlled environment room. In the future, duckweed can be a viable method for a possible durable waste management system involving.

10:30 a.m. ENV-12 Remediation of DNAPLS using emulsified zero-valent iron: Laboraotry and field results. C.L. GEIGER (1), C.A. CLAUSEN (1), C. CLAUSEN C.C. COON (1), K.B. BROOKS (1), C.A. HUNTLEY (1), L.B. FILIPEK (1), R. DEVOR (1), T.A. KRUG (2), S. O'HARA (2), D. MAJOR (2), and J. QUINN (3). (1) Department of Chemistry, University of Central Florida, 4000 Central Florida Blvd., Orlando, FL 32816-2366, Fax: 407-823-2252, (2) Geosyntec Consultants, (3) NASA, Kennedy Space Center. Research conducted at the University of Central Florida demonstrated the feasibility of using emulsions containing iron particles to expediate dehalogenation of DNAPL. The emulsion consisted of surfactant-stabilized, biodegradable oil-in-water emulsion with nanoscale or microscale iron particles contained within the emulsion

droplets. It was demonstrated that TCE diffuses through the oil membrane of the emulsion particle whereupon it reaches the surface of an iron particle in the interior aqueous phase and dehalogenation takes place. The reaction by-products of the dehalogenation reaction, primarily ethene, diffuse out of the emulsion droplet. Liquid TCE was degraded at a rate comparable to the degradation of dissolved-phase TCE by iron particles while unemulsified iron had a very low degradation rate. A field scale demonstration was deployed August 2002 at Cape Canaveral Air Station, Launch Complex-34.

10:45 a.m. BREAK

11:00 a.m. ENV-13 Electrodeposition of manganese dioxide on gold coated quartz crystal microbalances for hydrogen sensing. E.A. PEREZ, M. HAMPTON, M.L. SCHULZ, and A.F. SLATERBECK. Dept. of Chemistry and School of Optics/CREOL, University of Central Florida, P.O. Box 162366, Orlando, FL 32816. As fuel cell technology improves and the use of fuel cells becomes routine, there will be a need for small, inexpensive means to monitor hydrogen. Research conducted involved the preparation and analytical utility of MnO2 coated quartz crystal microbalances (QCM) for hydrogen sensing. Application of a potential of 1.10 V vs. Ag/AgCl to a gold coated QCM immersed in MnSO4 solution allowed for controlled deposition of the MnO2 on the exposed metal surface. Quality of coating was characterized through utilization of various techniques. The coated QCM retained its function and was capable of detecting the presence of hydrogen as it adsorbed to the MnO2 surface.

11:15 a.m. ENV-14 Photocatalytic reduction of Fe(VI) in aqueous solutions. Y. KRANSNOVA, V. SHARMA, C. WINKELMANN, and K. WINKELMANN. Florida Institute of Technology, Department of Chemistry, 150 West University Blvd, Melbourne, FL 32901. Fe(VI) (FeO42-) has been of great interest because of its role as an environmentally friendly oxidant in remediation and industrial processes. The reduction of FeO42- to Fe(III) was studied in UV-irradiated TiO2 suspensions to develop and understand a process for destruction of pollutants. In aerated suspensions, the rate of Fe(VI) reduction is found to be dependent on light intensity raised to the 0.5 power and the reaction is first order with respect to TiO2. The effects of [buffer] and [FeO42-] are also evaluated. Since ferrate could be used an environmentally benign oxidant for wastewater remediation, the photocatalytic oxidation of cyanate was studied. This reaction is first order with respect to [CNO-] and first order with respect to TiO2. The kinetics and mechanism of the reactions will be presented.

11:30 a.m. ENV-15 Use of *Lemna minor* species of duckweed in the removal of zinc (II), copper (II), and lead (II) Ions. C.A. BOWE (1), D.P. SMITH (2), and D.F. MARTIN (1). (1) Institute for Environmental Studies, Department of Chemistry, (2) Department of Civil Engineering, University of South Florida, 4202 East Fowler Avenue, Tampa, FL 33620.The pollution of water by heavy metals is a major environmental problem faced in industrialized and developing countries around the world. Treatment of freshwater sources by the use of aquatic plant life is a technology being explored worldwide (phytoremediation). The use of a common aquatic plant, duckweed, to remove such heavy metals as lead and cadmium from aqueous media is a widely popular technology in wastewater treatment. The current investigation reports the results of an investigation involving the use of the *Lemna minor* species of duckweed in the removal of copper(II), zinc(II), and lead(II) ions from standard solutions. This investigation was funded by a grant provided by the Storm Water Section, Hillsborough County Public Works Department.

11:45 a.m. ENV-16 Spectral properties and determination of singlet oxygen production by fluorene-based photosensitizers with potential application in two photon photodynamic cancer therapy. K.D. BELFIELD and C.C. CORREDOR. Department of Chemistry and School of Optics, University of Central Florida, Orlando, FL 32816. The photophysical characterization and the determination of singlet oxygen quantum yields (ϕ_Δ) for a class of fluorene derivatives with potential applications in two-photon photodynamic therapy have been performed in this study. It has been demonstrated the first time that these compounds possess the ability to generate singlet oxygen upon one-photon excitation, opening the door to their possible applications in two-photon photodynamic cancer therapy (TP PDT). The photochemical method using 1,3-diphenylisobenzofuran (DPBF) as a singlet oxygen chemical quencher was employed to determine the absolute singlet oxygen quantum yields (ϕ_Δ) of the fluorene-based photosensitizers in ethanol. Heavy atom effects were pronounced, with quantum yields of singlet oxygen generation ranging from 0.2 to 0.7. Mechanistic studies suggest that a type II mechanism is dominant. This study led to the identification of fluorene derivatives with very high singlet oxygen quantum yields in homogeneous polar solutions, comparative to that reported for haemathophorpyrin derivative, phthalocyanines and porphyrins.

12:00 p.m. BUSINESS MEETING: ENVIRONMENTAL CHEMISTRY AND CHEMICAL SCIENECS
CHERIE GEIGER, UCF, presiding

FRIDAY 2:00 p.m. CEDAR KEY BOARD ROOM 223
SESSION B
CHERIE GEIGER, UCF, presiding

2:00 p.m. ENV-14 Synthesis of acinetoferrin homologues. R. GARDNER and O. PHANSTIEL IV. Department of Chemistry, University of Central Florida, Orlando, FL 32816-2366. The cyclic imide form of acinetoferrin was shown to have a higher growth index for cross feeding *Mycobacterium paratuberculosis* than the natural siderophore, mycobactin J. Chain length and the presence of an imide were identified as key structural elements to impart higher growth rates. Therefore, four new homologues, both linear and cyclic, were synthesized, which elongated the parent compound. The key synthetic transformation involved a tandem oxidation and acylation of a primary amine to introduce an O-benzoyl protected hyrdoxamic acid. The synthetic strategies will be discussed.

2:15 p.m. ENV-15 Effect of Ti-catalysts on hydrogen storage properties of $LiAlH_4$. M. FRANJIC (1), J. GILBERT (1), M.D. HAMPTON (1), and D.K. SLATTERY (2). (1) Department of Chemistry, University of Central Florida, Orlando, FL 32816-2366, (2) Florida Solar Energy Center, 1679 Clearlake Rd., Cocoa, FL 32922. The hydrogen release characteristics of LiAlH4 were studied in relation to various titanium catalysts using a dry preparation technique consisting of the ball milling of LiAlH4 and Ti-dopant mixtures. The dopants included elemental titanium, titanium (II) hydride, TiCl3 and TiCl4. The addition of all dopants decreased the temperature required for hydrogen release, although the addition of TiCl3 and TiCl4 significantly lowered hydrogen capacity. Also, ball milling in the absence of the catalyst was found to decrease the release temperature of hydrogen.

2:30 p.m. ENV-16 Use of chemically modified montmorillonite for the removal of copper (II), cadmium (II), nickel (II), silver (I), and lead (II) ions. N. KRIKORIAN, C.A. BOWE, and D.F. MARTIN. Institute for Environmental Studies, Department of Chemistry, University of South Florida, 4202 East Fowler Avenue, Tampa, FL 33620. The extraction of heavy metals has become extensively popular around the world. Different methods have been used to remove heavy metals from plants or aqueous media. Montmorillonite, a three-layered expanding clay, has a large surface area and ability to exchange of such cations as calcium and sodium. In this study, montmorillonite, chemically modified by 2-mercaptoethanol, was used in the extraction of copper(II), cadmium(II), nickel(II), silver(I) and lead(II) ions from standard solutions.

2:45 p.m. BREAK

3:00 p.m. ENV-17 High throughput structure determination (HTSD) to elucidate cancer progression mechanisms in functionally unclassified proteins. S. OZYURT (1) and T.L. SELBY (1,2). (1) Biomolecular Sciences Program, (2) Dept. of Chemistry, Univ. of Central Florida, Orlando, FL 32816. Bioinformatics and proteomics studies have been initiated to elucidate the role of 205 proteins involved in cancer. Due to the mechanism of action for these proteins not being known, we are using structure determination via x-ray crystallography and "Fold" recognition via molecular modeling to determine the functional role of each protein in cancer progression. This data will be used to develop cancer therapies based on the three dimensional structures of these proteins and will provide insight into each protein's mechanism of action in cancer progression.

3:15 p.m. ENV-18 Designing cross reactive enzyme inhibitors to control junction pathway metabolism in the treatment of genetic disorders. H.A. DAVIS (1) and T.L. SELBY (1,2). (1) Biomolecular Sciences Program, and (2) Dept. of Chemistry, Univ. of Central Florida, Orlando, FL 32816. Metabolic junction pathways exist when a single metabolite can be converted to many different products. This indicates that specific enzymes are capable of binding the same molecule, and performing an entirely different chemical reaction. This coupling of metabolite "recognition" and "catalysis" allows for the design of drugs which can inhibit a number of different enzymes in this junction pathway system. Implementation of this drug design approach targeted to metabolic disease related proteins is now underway through molecular modeling and bioinformatics technology.

3:30 p.m. ENV-19 Using genetic diversity to improve drug design through reverse structure activity relationships (rSAR). T.L. SELBY. Dept. of Chemistry, Univ. of Central Florida, Orlando, FL 32816. Structure Activity Relationships (SAR), use molecules with varied functional groups to determine which groups increase or decrease biological activity. This type of analysis can provide optimal compounds based on the combination of specific functional groups in a combinatorial manner where many molecules need to be compared. With the advance of genomic sciences providing a large number of proteins for functional study, we are now able to analyze the diversity of enzyme active sites among various organisms that catalyze identical reactions. This active site analysis is analogous to SAR, but is completed in reverse (rSAR). In these studies, we use the same substrate for different enzymes to understand how nature has achieved combinatorial optimization of active sites over millions of years.

3:45 p.m. ENV-20 Synthesis of a new fluorene derivative for two-photon absorption. K.D. BELFIELD, K. MILUM, and A.R. MORALES. Deptartment of Chemistry, University of Central Florida, P.O. Box 162366, Orlando, FL 32816. Synthesis of a new fluorene derivative, 5-(9,9-didecyl-7-diphenylamino-9*H*-fluoren-2-yl-methylene)-pyrimidine-2,4,6-trione, has been performed. Molecule design was based on previous experience on enhancement of the two-photon cross section with the presence of diphenylamine as an electron donor, fluorenyl ring system as the conjugated π bridge for both its thermal and photostability, and substitution with decyl groups at the 9- position for ease of solubility in a range of organic solvents. The addition of barbituric acid was decided upon for its strength as an electon acceptor and as a compliment to the amine bases thymine and uracil, components of DNA and RNA respectively.

POSTERS: ENV. CHEM. & CHEM. SCIENCES

STUDENT UNION 302, FRIDAY 8:00 a.m. – 4:00 p.m

POS-10 Synthesis of nitrogen containing derivatives of podocarpic acid. J.V. RUPPEL, K. HESTER II, R. FLEMMING, T. WRIGHT, G. CUNNINGHAM, and D.H. MILES. UCF, 4000 Central Florida Blvd. Orlando, Fl 32816-2366. Podocarpic acid, a diterpene resin acid, has been widely studied through the preparation of novel derivatives and reported biological activities. Previous work has concentrated on derivatives of the C-ring system and the C-1 carboxylic acid group. A literature search reveled no substituted nitrogen containing derivatives. Thus we wish to report new methodologies for preparing amine, imine, and amide derivatives of podocarpic acid and the biological evaluation of these derivatives for activity against cancer and bacterial pathogens.

POS-11 A search for new anti-tuberculosis agents from synthetics and natural products. K. HESTER II, J.V. RUPPEL, S. NASER, E. GOUN, G. CUNNINGHAM, and D.H. MILES. University of Central Florida, 4000 Central Florida Blvd, Orlando, FL 32816-2366. The reemergence of tuberculosis and especially multi drug resistant (MDR) strains of tuberculosis due to the AIDS epidemic has created a need for sources of possible chemotherapeutics. Natural products and synthetic hetrocyclic compounds have been screened for anti-tuberculosis activity utilizing the BACTEC bioassay system. The results of these screening studies are reported along with the procedures for synthesizing the novel active nitrogen containing compounds.

POS-12 A search for new drug leads for treatment of breast cancer. T. WRIGHT, J.V. RUPPEL, K. HESTER II, E. GOUN, R.

TARNUZZER, G. CUNNINGHAM, and D.H. MILES. University of Central Florida, 4000 Central Florida Blvd. Orlando, FL 32816-2366. A series of nitrogen containing synthetics have been patented by the University of Central Florida because of their demonstrated activity against human breast cancer cells. In order for these compounds to have the potential to be utilized as new chemotherapeutic agents the mechanism of action should be determined against specific molecular targets. This work reports studies on these compounds that involves determining their effects upon: cell proliferation, tumor cell apoptosis (programmed cell death), and gene expression. The compounds that express the highest selectivity will become candidates for drug development.

FLORIDA COMMITTEE ON RARE AND ENDANGERED PLANTS AND ANIMALS

FRIDAY 9:00 a.m. – EDGEMONT ROOM 224
JACK STOUT, UNIVERSITY OF CENTRAL FLORIDA, presiding

9:00 a.m. RES-1 Preliminary testing of survey techniques for *Drymarchon corais couperi* (Eastern Indigo snake). K.J. DYER (1) and R.B. SMITH (2). (1) UCF, PO Box 162368, Orlando, FL 32816, (2) Dynamac Corp., Mail Code DYN-1, Kennedy Space Center, FL 32899. We tested two potential survey techniques for the eastern indigo snake from Oct. 2002 through Feb. 2003 on Kennedy Space Center/Merritt Island NWR, FL. Twenty-four drift fence arrays, each with one large box trap and two large funnel traps, were installed at three sites in four different habitat types. Traps captured a variety of snakes (including eastern indigos), frogs, and small mammals. Road surveys were conducted daily on 9.5 km of road. The two techniques were evaluated and compared, based on effectiveness and cost-efficiency, for both short-term and long-term monitoring and research applications. USFWS, NASA, MINWR, UCF and Greater Cincinnati Herpetl Society provided financial and logistical support.

9:15 a.m. RES-2 Preliminary findings of nested clade analysis on Loggerhead turtle control region haplotypes. J.S. REECE, T.A. CASTOE, and C.L. PARKINSON. UCF Biology, 4000 Central FL Blvd., Orlando, FL 32816. Analysis of a 380 base pair fragment of the D-loop control region reveals population structure for 23 haplotypes specific to nesting beaches in the Atlantic and Mediterranean. Nested clade analysis of haplotypes reveals evidence of range expansion and migration events between rookeries of the loggerhead turtle (*Caretta caretta*). Maximum parsimony is used to estimate relationships among populations. These

relationships are discussed and compared with findings from nested clade analysis to present a well supported hypothesis for the colonization of nesting beaches by gravid females and their dispersal routes. These data are compared with previous estimates for dispersal mechanisms and general life history characters of the loggerhead turtle.

9:30 a.m. RES-3 Weight loss as a trap response in the endangered Beach mouse, *Peromyscus polionotus phasma*. A. SUAZO (1,2), A. DELONG (1,2), and A. BARD (2). (1) University of Central Florida, Orlando, FL 32816, (2) Department of Environmental Protection, 1800 Wekiwa Circle, Apopka, FL 32712. A population of Anastasia Island Beach Mouse at Anastasia State Park was trapped for two days every three months for seven years. It was noted that recaptured individuals generally lost a significant portion of their body mass. As a consequence of the trapping experience, it is hypothesized that small mammals which are repeatedly captured within a short interval will lose mass. This tendency has been observed in *Sigmodon hispidus*, *Microtus ochrogaster*, *Microtus pennsylvanicus*, and four species of small mammals from Europe and Africa. The purpose of this analysis is to investigate weight loss based on repeated trapping of *Peromyscus polionotus phasma* and to determine if the weight loss is of statistical significance.

9:45 a.m. RES-4 Growth and reproduction of *Clitoria fragrans*, including response to fire. L.G. CAGE, S.R. KANE, and I.J. STOUT. Department of Biology, University of Central Florida, P. O. Box 162368, Orlando, FL 32816-2368. *Clitoria fragrans*, a Federal- and State-listed plant species, was studied on the Avon Park Air Force Range near Avon Park, Florida. Height growth and reproduction of tagged individuals were monitored on several sites. Local habitat variables were measured to characterize the places where the plants occurred. We identified or measured soil type, ground cover, vegetative canopy, and photosynthetically active radiation (PAR). A subset of plants was examined to document stem length, numbers and types of flowers and fruits, dates of first and last flowering and fruiting, and evidence of consumption by herbivores. Response in one population to a prescribed summer burn was examined with regard to immediate effect of fire, rapidity of recovery to fire, growth, and reproduction.

10:00 a.m. BREAK

10:15 a.m. RES-5 Marine turtle nest production and reproductive success on a shore protection project in Brevard County, Florida. K. ROBERTS, J. REECE, and L.M. EHRHART. Dept. of Biology, UCF,

4000 Central Florida Blvd., Orlando, FL 32816. Nourishment projects are often implemented in areas with high marine turtle nesting densities. In 2002, prior to the marine turtle nesting season, construction of a shore protection project was initiated on the central east coast of Florida in Brevard County, encompassing 5 km of shoreline. The effects of beach nourishment on loggerhead and green turtle nesting and reproductive success were assessed. Nesting success rates of 31.0% for loggerheads and 28.7% for green turtles were observed. A representative sample of nests assessed for reproductive success demonstrated loggerhead and green turtle rates as 59.8% and 72.8%, respectively. Hatchling disorientations were also documented. In the past ten years a total of 28 incidents involving the disorientation of emerged hatchlings have been recorded in the 5 km section of beach newly nourished this year. In the 2002 season 27 disorientations were documented. The altered profile and the effects of beach nourishment on marine turtle nesting activity will be discussed.

10:30 a.m. RES-6 Rare plants of Kennedy Space Center. P.A. CHMALZER, T.E. FOSTER, and B.W. DUNCAN. Merritt Island National Wildlife Refuge, Cape Canaveral Air Force Station, and Canaveral National Seashore, Dynamac Corporation, DYN-2, Kennedy Space Center, FL 32899. Adjoining federal properties on the east coast of central Florida include Kennedy Space Center/Merritt Island National Wildlife Refuge, Cape Canaveral Air Force Station, and Canaveral National Seashore. Studies conducted since the 1970s indicate that the vascular flora is about 1024 taxa of which 803 are native and 221 are introduced. Thirty-eight taxa are listed as threatened, endangered, or of special concern on state lists (Florida Department of Agriculture, Florida Natural Areas Inventory). Habitats of these rare plants include coastal dunes and strand, maritime hammock, oak scrub, pine flatwoods, oak hammocks, and marshes. For some of these taxa, populations here appear to be important for their regional and global survival.

10:45 a.m. BUSINESS MEETING: FLORIDA COMMITTEE ON RARE AND ENDANGERED PLANTS AND ANIMALS
JACK STOUT, UNIVERSITY OF CENTRAL FLORIDA, presiding

GEOLOGICAL AND HYDROLOGICAL SCIENCES

FRIDAY 9:00 a.m. – KEY WEST ROOM 218C
GARY MADDOX, FL. DEPT. ENVIRONMENT. PROTECT., presiding

9:00 a.m. GHS-1 Application of the weights of evidence method to assess aquifer vulnerability in Florida. A.E. BAKER, J.R. CICHON, J.D.

ARTHUR, and H.A.R. WOOD. Fl. Geol. Survey, 903 W. Tennessee St, Tallahassee, FL 32304. The Florida Geological Survey is developing a GIS model (FAVA) to use in the prediction of the vulnerability of Florida's major aquifers to contamination. FAVA differs from the Environmental Protection Agency DRASTIC model in that the newer technique is GIS-based and accounts for Florida's karstic terrain. The Weights of Evidence analytical method is utilized as a method for quantifying relationships between layers with actual contaminant occurrences in order to assess a hypothesis. These calculated relationships, are analyzed to yield a data-driven predictive model, which currently utilizes the following spatial layers (evidential themes): thickness of confining unit, soil drainage, and the percentage of an area covered by karst features.

9:15 a.m. GHS-2 Assessment of long term trends (decades) in Florida spring water quality. R.E. COPELAND. Florida Geological Survey, 903 W. Tennessee St, Tallahassee, FL 32304-7700. Florida has over 700 recognized springs. Unfortunately, chemicals produced by man's landuse activities that enter aquifer systems through natural recharge processes can negatively impact the quality of spring water. In addition, because of the high demand of groundwater, heavy pumping can potentially lower aquifer water levels. This can result in a negative impact on both the flow rate and the water chemistry of springs. Thirteen first-magnitude springs were sampled for 17 common chemicals by governmental agencies in 1948, the early 1970s, 1985, and 2001. These four sets of consistent data were used for long term trend detection. Results indicate that between the early 1970s and 2001, nitrate concentrations have increased in the 13 first-magnitude springs almost 20-fold. The increase is tied to land use activities in the vicinity of the springs and is adversely affecting aquatic life in several of the associated spring runs. Between the 1985 and 2001, total dissolved solids (TDS) have significantly increased. This could be related to the recent decrease in Florida's rainfall since the late 1990s, which has lowered ground-water levels and discharge from springs. Evidence suggests that mineralized groundwater from the deeper portion of Florida's aquifers could be the reason for the increase in TDS. Currently, this theory is being checked by analyzing spring data collected either quarterly or bimonthly from the state's water management districts since the 1980s.

9:30 a.m. GHS-3 Creating a statewide digital elevation model (DEM) from US Geological Survey 1:24000 topographic map contour lines. A. RUDIN, A. BAKER, A. WOOD, J. CICHON, J. ARTHUR, and B. ASHBY, Florida Geological Survey (FGS), 903 W. Tennessee St., Tallahassee, FL 32304. Current US Geological Survey 90-meter DEM's for the State of Florida contain several errors. An improved, more resolute

DEM for the state is needed to derive the minimum water table and top of the intermediate confining unit for the Florida Aquifer Vulnerability Assessment (FAVA) Project, currently under development by the FGS. This task requires the edge-matching of elevation contours from over 1,000 1:24000 topographic maps and the correction of errors in original data through visual inspection. Contour lines are then transferred to a raster dataset using a triangulated irregular network. A secondary output of this project will be a statewide topographic depression coverage to facilitate development of a karst feature coverage.

9:45 a.m. GHS-4 Development of a springs glossary and classification for use in Florida. R.E. COPELAND. Florida Geological Survey, 903 W. Tennessee St. Tallahassee, FL 32304-7700. In the spring of 2002, a significant number of Florida's hydrogeologists met and discussed the significance and importance of protecting Florida's springs from contamination related to man's landuse activities. Many of the participants argued that in order to efficiently protect Florida's springs, a firm understanding of them is critical. It was decided that a glossary of spring terms should be developed. The Florida Geological Survey (FGS) assumed the lead role in its development. The FGS organized a Spring Nomenclature Committee made up of representatives of governmental agencies, the state university system, hydrogeologists from around the state and private citizens. The glossary consists of the most commonly used spring terms, along with their synonyms. As much terminology as possible was taken from professional dictionaries and glossaries. It is anticipated that the glossary will enable both the scientific community and the public to use a set of standardized terms. During the development stage of the glossary, it became apparent that a spring classification system should also be developed. This newly developed classification system is a model that enables one to envision the relationship of one spring to the others within the state. As it turns out, all of Florida's springs can be grouped into only a handful of different classes. This was fortunate in that it greatly reduces the complexity in the way we think of our springs.

10:00 a.m. BREAK

10:15 a.m. GHS-5 Electronic capacitors used as gravimeters. A.M. CURRY. Mesa State College, 1100 North Avenue, Grand Junction, CO 81501-3122. An entirely electronic means to measure and record local gravity values, with applications to geologic exploration, is introduced. An explanation of the monitoring method's circuitry and operation is given, followed by a discussion of the potential contributions to exploratory geology currently utilizing mechanical gravimeters.

10:30 a.m. GHS-6 Lower East Coast regional MODFLOW model. J.B. GIDDINGS (1), J.I. RESTREPO (2), and L.L. KUEBLER (1). (1) South Florida Water Management District, 3301 Gun Club Road, West Palm Beach, FL 33416, (2) Florida Atlantic University, 777 Glades Road, Boca Raton, FL 33431. Lake Okeechobee is the primary source of water in South Florida for the Everglades system, as well as agricultural and urban areas during a rainfall deficit. Water is pumped from Lake Okeechobee to the Everglades through a series of canals and control structures, ultimately discharging to Florida Bay. Water is also diverted eastward to urban areas where it is used to control canal stages, which recharge local wellfields, and reduce the threat of saltwater intrusion. A ground water flow model of the Surficial Aquifer System was developed as a cooperative effort between SFWMD and FAU using a modified version of the modular, three dimensional, finite difference, ground water flow model, MODFLOW. Model components include evapotranspiration, aquifer recharge, canal/aquifer interactions, ground water withdrawals, wetland and river flows, and structure operations. The resulting interpretive and predictive model simulates the hydrology and management of the water resources system from Lake Okeechobee to Florida Bay and provides a means of analyzing various management alternatives and water supply plans.

10:45 a.m. GHS-7 Mapping the intermediate confining unit/ intermediate aquifer system in Florida. H.A.R. WOOD III, J.D. ARTHUR, B.N. ASHBY, A.E. BAKER, and J.R. CICHON. Florida Geological Survey (FGS), 903 W. Tenn. St., Tallahassee, FL 32304. The intermediate confining unit/intermediate aquifer system (ICU/IAS) comprises highly variable fine-grained siliciclastic deposits and low-permeability limestone and dolostone of Miocene and younger Series. The ICU/IAS retards the flow of ground water between the overlying surficial aquifer system and the underlying Floridan aquifer system. Most previous efforts to characterize the ICU/IAS have typically been limited to regional studies. There exists a need for a statewide geographic information system coverage of the ICU/IAS for use in the Florida Aquifer Vulnerability Assessment model currently under development at the FGS. Methods for statewide characterization of ICU/IAS involve evaluation of detailed well data to accomplish advanced three-dimensional surface modeling using geostatistical analysis methods.

11:00 a.m. GHS-8 QAQC and applications of the National Hydrography Dataset (NHD) by the St. Johns River Water Management District. S.L. FOX. SJRWMD, Palatka, FL 32178-1429. The NHD is a comprehensive set of digital spatial data that contains information about surface water features such as lakes, ponds, streams, rivers, springs and

wells. Within the NHD, surface water features are combined to form "reaches," providing the framework for linking water-related data to the NHD surface water drainage network and enabling the analysis and display of these water-related data in upstream and downstream order. In anticipation of using the NHD in a number of applications, the SJRWMD examined the NHD within its boundaries and found a number of problems within the dataset, then contracted for a thorough QAQC, investigation of NHD repair/correction methodologies and repair of the problems, if possible. Data from the QAQC, including repairs that were successfully made as well as serious remaining weaknesses, will be presented.

11:15 a.m. GHS-9 Salinity simulation models for Florida Bay. F.E. MARSHALL (1), D. SMITH (2), and D. NICKERSON (3). (1) Cetacean Logic Foundation, Inc., 340 North Causeway, New Smyrna Beach, FL 32169, (2) Everglades National Park, Homestead, FL 33034, (3) University of Central Florida, Orlando, FL 32816. Seasonal autoregressive integrated moving average (SARIMA) and multivariate linear regression time series models for salinity were developed using daily values of Everglades water levels, Taylor Slough and C-111 Canal flows, wind, rainfall, and tide for eight locations in north and central Florida Bay. The period of record for the data is October, 1994 through September, 2001. SARIMA models were inhibited by data and SAS software limitations. Multivariate linear regression models had no such restrictions. Models were developed with R2 values exceeding 0.92 for all stations but one. Simulation models will be used as transfer functions with SFWMD 2X2 model output to evaluate salinity regime variations in Florida Bay for water delivery scenarios.

POSTERS: GEOLOGICAL & HYDROLOGICAL SCIENCES

STUDENT UNION 302, FRIDAY 8:00 a.m. – 4:00 p.m.

POS-13 Florida aquifer vulnerability assessment. J.R. CICHON, J. ARTHUR, A. BAKER, and H.A.R. WOOD III. Florida Geological Survey, 903 W. Tennessee St., Tallahassee, FL 32304. The Florida Geological Survey is currently developing a GIS model to estimate the relative vulnerability of Florida's aquifer systems: the Florida Aquifer Vulnerability Assessment (FAVA). Model development is currently in the preliminary stages consisting of five countywide projects. The overall intent of FAVA is the development of a tool for environmental, regulatory and planning professionals to facilitate the protection of Florida's ground-water resources. Weights of Evidence, the current method employed in the FAVA model, quantifies relationships between spatial layers with actual contaminant occurrences in order to assess a hypothesis. The model

currently utilizes the following spatial layers (evidential themes): thickness of confining unit, soil drainage, and spatial distribution of karst features.

POS-14 Preliminary springshed map for Florida's first magnitude springs. T.H. GREENHALGH. Florida Geological Survey, Gunter Building MS# 720, 903 West Tennessee Street, Tallahassee, FL 32304-7700. The Florida Geological Survey in conjunction with the Northwest Florida, Suwannee River, St. Johns River and Southwest Florida Water Management Districts, as well as the United States Geological Survey are working together to develop a preliminary map of Florida's first magnitude spring recharge basins (springsheds). This map is a compilation of the readily available first magnitude springshed boundary maps. The purpose of the map is to inform decision makers (e.g., county commissioners, legislators, and local and state agency personnel) and citizens about the importance of appropriate land use with in a springshed and to establish a baseline for the further refinement of the springshed boundaries. As on-going and future research improves the understanding of the groundwater hydrology of these springsheds, more accurate maps of the individual springsheds will be available at the Florida Geological Survey.

MEDICAL SCIENCES

SATURDAY 8:00 a.m. – KEY WEST ROOM 218
ROSEANN S. WHITE, UNIVERSITY OF CENTRAL FLORIDA, presiding

8:00 a.m. MED-1 A potential new mechanism for topotecan-induced apoptosis. P.A. VALDECANTOS (1), M. ROLDAN-OLARTE (1), E.I YSLAS (2), E. PYTON (3), V. RIVAROLA (2). and C. MERCHED WHITACRE (3). (1) Dev. Biol. Dept., National University of Tucuman, Argentina (2) Mol. Biol. Dept., University of Rio Cuarto, Argentina (3) Barry University 11300 NE 2nd Avenue, Miami Shores, FL 33161. We used HeLa F human cervical cancer cells confluent and in logarithmic growth to study the effect of the chemotherapeutic drug topotecan, on the levels of expression of p125 focal adhesion kinase (FAK) and cell adhesion. Cells were treated during 24-48 hs with increasing doses of topotecan (0.1-1 μM). Our results suggest an alternative mechanism for TPT cytotoxicity: Inhibition of FAK-induced anoikis (Supported by NIH-NCI-K1CA77065 and MARC grant MBRS Rise 292553).

8:15 a.m. MED-2 Involvement of NAD-Poly(ADP-Ribose) metabolism on p53 regulation by topotecan. E.I YSLAS (1), P.A.

VALDECANTOS (2), M. ROLDAN-OLARTE (2), and C. MERCHED WHITACRE (3). (1) Mol. Biol. Dept., University of Rio Cuarto, Argentina (2) Dev. Biol. Dept., National University of Tucuman, Argentina (3), Barry University 11300 NE 2nd Avenue, Miami Shores, FL 33161. We have evaluated the effect of NAD/poly(ADP-ribose) polymerase (PARP) metabolism deficiency on Topotecan induced apoptosis in HeLa cervical cancer cells. Cells grown in the absence or presence of NAD were treated during 24-48 hs with increasing doses of topotecan (0.1-1 μM). Our studies suggest that NAD/PARP synthesis may be involved in TPT-induced apoptotic pathway and p53 regulation (Supported by NIH- NCI-K1CA77065).

8:30 a.m. MED-3 Cross-reactivity between timothy and bahia grass pollen allergens. J.M. WHITE, A. MAJIDI, G. GHOBRIAL, S. NASER, M.J. SWEENEY, and R.S. WHITE. UCF, Dept. Molecular Biology and Microbiology, Orlando, FL 32816. Bahia grass pollen is one of the more important grass aeroallergens in the Southeastern United States and is especially prevalent in the Gulf coast states. Timothy grass pollen is one of the most common in Europe. Cross-reactivity between the proteins of these two grass pollens has previously been demonstrated. The purpose of the study reported here is to further evaluate bahia pollen proteins for their cross-reactivity with timothy using a series of monoclonal antibodies produced to Group I, Group V and Group XIII timothy grass allergens. The group I monoclonal reacted, not only with the timothy crude extract pollens, but also to a number of proteins in the crude extract and partially purified extracts of bahia. The group XIII monoclonals (AF 6, DF 11 and EG 9) reacted with a 55kDa protein of timothy and a protein of bahia of similar molecular weight. The timothy group V monoclonal showed varied reactivity. The amino acid sequence similarity of the major allergen of bahia to that of the group I timothy major allergen and the ability of bahia proteins to react with monoclonal antibodies directed against timothy Group I and XIII allergens provide further evidence that these two grass pollens share common epitopes and are cross reactive.

8:45 a.m. MED-4 Western blot analysis and deglycosylation of bahia protein allergens. G. GHOBRIAL, S. NASER, M.J. SWEENEY, and R.S. WHITE. University of Central Florida, Dept. Molecular Biology and Microbiology, Orlando, FL 32816. Pollen of bahia grass (*Paspalum notatum*) is a major cause of type I allergy in the southeastern United States and sub-tropical areas. Four allergenic proteins of bahia pollen with estimated molecular weights of 45, 33, 31 and 28 kDa have already been identified by the investigators using isoelectric focusing, SDS-PAGE, and western blotting. The 33 kDa allergen (Pas n 1) was the most reactive to IgE

and focused at a pI of 6.59. Reactivity of all four of these proteins with IgE from bahia allergic patients' sera was confirmed using sera from patients' skin test positive to bahia. After deglycosylation, no changes in electrophoretic mobility were noted for the 33 and 45 kDa components. A cDNA library has been constructed from bahia pollen messenger RNA, cloned into the lambda ZAP vector, amplified and expressed in Escherichia coli strain XLI Blue. Synthesis of cDNA from pollen mRNA produced cDNA molecules with sizes ranging from 300 bp to 4,500 bp. Screening the bahia cDNA library using sera from patients' skin test positive to bahia identified many positive plaques encoding IgE binding proteins; however, difficulties in screening the library were encountered due to antibody reactivity with E. coli and phage lysate. Studies continue to evaluate the clones for expression of bahia allergens.

9:00 a.m. MED-5 Inhibition of NAD-Poly (ADP-Ribose) metabolism induces HeLa S cell adhesion and resistance to topotecan. C. MERCHED WHITACRE. SNHS-Biology, Barry University, Miami Shores, FL 33161. The effect of NAD/poly(ADP-ribose) polymerase (PARP) metabolism deficiency on HeLa S cell adhesion and sensitivity to the topoisomerase I inhbitor Topotecan was evaluated. Cells grown in the absence or presence of NAD were treated with increasing doses of topotecan (0.1-1 μM). Interference with NAD/PARP metabolism induced HeLa S cell adhesion associated with resistance to Topotecan as shown by acridine orange staining and cleavage of PARP. These results are crucial to the development of new therapeutic strategies for the treatment of solid tumors. (Supported by NIH- NCI-K1CA77065).

9:15 a.m. MED-6 Evaluation of the nicotine effect on the growth conditions of oral Cavity and gastrointestinal tract bacterial residents. N. SFEIR, W. DEEB, C.G. GHOBRIAL, C. ROMERO, AND S.A. NASER. University of Central Florida, Department of Molecular Biology and Microbiology, 4000 Central FL Blvd., Orlando, FL 32816. Nicotine is considered the addictive and most pharmacologically active substance among the many compounds present in tobacco products. The effect of nicotine on microbiota residents of the oral cavity and gastrointestinal tract has been investigated. Nicotine at final concentrations of 0, 1.25, 2.5 and 5 ug/mL was tested against 15 different microorganisms ranging from Gram negative, Gram positive and acid-fast bacteria. Surprisingly, all microorganisms were susceptible to nicotine with minor variation in the level of susceptibility. The effect of nicotine on these microorganisms was determined to be bactericidal. The MIC90 reported here is significantly low compared to normal nicotine level in saliva of those using tobacco-based products (70 to 1560 ug/mL). The data suggest that nicotine has a strong

antimicrobial activity, especially against the microbial residents of the oral cavity and the gastrointestinal tract, indicating a potential role for its application in the treatment of bacterial-caused disease. However, the antimicrobial effect may lead to a failure in the main line of defense in those hosts who smoke and or use tobacco-based products.

9:30 a.m. MED-7 Serological investigation of Crohn's Disease against mycobacteria. S. YANG, G. GHOBRIAL, C. ROMERO, and S.A. NASER. University of Central Florida, Department of Molecular Biology and Microbiology, 4000 Central FL Blvd., Orlando, FL 32816. Current methods for Crohn's disease (CD, a chronic inflammatory bowel disease that affects more than one million patients) diagnosis are invasive, highly distressing, and expensive and must be administered frequently. In this study, a genomic library of *Mycobacterium avium* subsp. *paratuberculosis* (MAP), an acid-fast bacillus suspected of causing many CD cases, has been constructed and the pB11 recombinant clone expressing a 23 kDa antigen has been identified. The expressed protein has been partially purified and currently analyzed against sera from CD and controls patients. Preliminary data indicate that pB11 protein is reactive to sera from the majority of CD patients. Interestingly, this protein reacts poorly to none-CD patients and healthy controls. These results suggest that the pB11 recombinant clone has a potential use for the serodiagnosis of CD.

9:45 a.m. MED-8 Molecular typing of mycobacterial isolates cultured from Crohn's Disease patients. L. ADAMS, G. GHOBRIAL, C. ROMERO, and S.A. NASER, University of Central Florida, Department of Molecular Biology and Microbiology, 4000 Central FL Blvd., Orlando, FL 32816. The role of *Mycobacterium avium* subsp. *paratuberculosis* (MAP) in Crohn's disease (CD, a chronic inflammatory bowel disease) pathogenesis has been investigated. The fastidious characteristics and the cross reactivity of MAP with other members in mycobacteria produced significant challenges in their identification. In this study, four PCR-molecular assays have been employed in an attempt to specifically differentiate MAP from other mycobacteria, especially members of the *M. avium* complex (MAC). A total of 35 mycobacterial isolates were subcultured. Genomic DNA was extracted and then subjected to PCR typing. The preliminary data indicate that the majority of the isolates belonged to the MAC. Specifically many of them produced PCR patterns similar to that of the *M. avium* subsp. *avium* (MAV). Sequencing analyses revealed that MAP and MAV are closely related, and the usage of the proposed assays may assist in their correct identification.

10:00 a.m. BREAK

10:15 a.m. MED-9 Investigation of possible defects in the phagocytosis mechanism of PMN's and MNC's derived from Crohn's disease patients. C. ROMERO, G. GHOBRIAL, S. YANG, J. BIGGERSTAFF and S.A. NASER. UCF, Department of Molecular Biology and Microbiology, 4000 Central FL Blvd, Orlando, FL 32816. Crohn's disease (CD) is a chronic inflammatory bowel disease with increasing debate that *Mycobacterium avium* subsp. *paratuberculosis* (MAP) may play a major role in many of the cases. Defect in the immune system of CD patients has been reported, especially in the ability of the cells to phagocytose. We have studied a total of ten subjects (7 with CD and 3 with non-IBD (NIBD)) and three healthy control donors. The in vitro phagocytosis assay has been performed on purified PMN's and MNC's exposed to FITC-labeled MAP. Out of the 7 CD samples, 4 were active for PMN's phagocytosis (3-209% above control level) whereas 3 showed defect in PMN's phagocytosis ability (30 to 51% below control level). The three NIBD samples had a normal PMN's phagocytosis. At the MNC's level, defective cells illustrated by poor phagocytosis were observed in 2 of the same 3 CD patients. All three NIBD patients illustrated strong MNC's defect. The data so far suggest that in vitro phagocytosis by PMN's and MNC's from CD patients may provide valuable evidence towards the cellular immune system status in CD pathogenesis.

10:30 a.m. MED-10 Evaluation of the cellular immune response of lymphocytes and monocytes proliferation in the pathogenesis of Crohn's Disease. C. ROMERO, G. GHOBRIAL, S. YANG, and S.A. NASER. UCF, Department of Molecular Biology and Microbiology, 4000 Central FL Blvd., Orlando, FL 32816. We plan to investigate the immunoreactivity of stimulated mononuclear cells from Crohn's disease (CD) and NIBD subjects using an in vitro cell proliferation assay. A total of ten subjects (7 with CD and 3 with NIBD) have been studied. Purified MNC's were cultured in the presence of stimulating substances like 1) a recall antigen from *Candida albicans*, mitogens such as phytohaemagglutinin (PHA) and whilst pokeweed mitogen (PWM), and a purified protein derivative (PPD-MAP). The MNC's were then labeled with BrdU and cell proliferation was determined. Preliminary results suggest lymphocyte proliferation assay may be a valuable marker in the evaluation of the MAP role in CD pathogenesis. So far 4/7 CD patients showed a clear failure in the lymphocytes responsiveness. One CD patient has been confirmed to have a MAP role and 2 CD patients were confirmed for the absence of MAP. A large-scale investigation for these markers is underway.

10:45 a.m. MED-11 A model system to study a human gene associated with cancer. R.P. RUGGIERO, A.F. LEPPERT, C. BAYER,

and L. VON KALM. UCF, Biology Dept., RM 301, 4000 Central Florida Blvd., Orlando, FL 32816-2368. The human protease Hepsin is implicated in late-stage tumor progression of several human cancers, but its role is currently unclear and difficult to study in human cells. Human and *Drosophila* genes have been frequently shown to be functionally interchangeable and developmental mechanisms are highly conserved between humans and *Drosophila*. Therefore, we have established a model system to study Hepsin function in normal *Drosophila* cells. We have generated transgenic *Drosophila* expressing the human Hepsin gene in developing eyes. The eye phenotype of these transgenic flies is highly abnormal indicating that Hepsin interferes with normal eye development. We are currently determining how Hepsin interferes with normal eye development, with the aim of identifying potential roles for hepsin in normal and cancerous tissues.

11:00 a.m. MED-12 Comparison of the coccidial colonization of the jejunum and ileum in the *Eimeria* infected pheasant. C.C. DARVILLE (1), K.M. NEYER (1), V. LETKOVA (2), M. GOLDOVA (2), and A.T. MARIASSY (3). (1) Barry Univ., Miami Shores, FL 33161, (2) Univ. of Vet. Med. Kosice, Slovakia, (3) Nova Southeastern University, Ft. Lauderdale, FL 33328. Coccidial parasitism results in a specific pattern of lesions in the intestine that varies with the *Eimeria* and host species. Experimentally infected (*E. duodenalis*, 5k/animal) 12 pheasant chicks, 2 a day were examined at day 1 through day 6 post infection (pi.). Differential counts of parasitic forms including: 1st through 3rd generations of schizonts, gametocytes and oocysts were made in H&E whole gut cross sections. Counts ranged (from–to) 0-1278 of the 1st & 2nd 0-26 3rd generations of schizonts, 0-94 gametocytes and 0-94 oocyst/jejunal section in contrast to the ileum, which contained 37-158, 0-49, 16-132, 4-12 &16-132 respectively. ANOVA showed statistically significant differences between the two segments. These results support the qualitative observation that the coccidial parasite spreads and colonize both the jejunum and ileum. NSU Faculty Research Grant

11:15 a.m. BREAK

11:30 a.m. MED-13 Carbohydrate expression of the epithelial Surface of duodenum in *Eimeria* infected pheasant. L.DIAZ (1), V. LETKOVA (2), M. GOLDOVA (2), and A.T. MARIASSY (3). (1) Barry Univ., Miami Shores, 33161, (2) Univ. of Vet. Med. Kosice, Slovakia, (3) Nova Southeastern University, Ft. Lauderdale, FL 33328. The attachment of coccidia to the specific intestinal segments is based on the interaction of carbohydrates and lectins on the parasites and duodenal epithelium. We

quantified the carbohydrate expression of the colonizing *Eimeria duodenalis* with lectin probes in duodenal epithelium of control and *E. Duodenalis* (5k/animal) infected pheasant chicks at 1 and 6 days post infection (p.i.) Lectin binding was detected by Avidin-Biotin, Vector KitÒ. RGB (red, green, blue) values were determined on digital images and compared by ANOVA. There were $p>0.05$ differences among lectin expression between day 1 and 6 p.i. We conclude that the pathogenesis of parasite-host interaction in coccidiosis is associated with an altered expression of carbohydrates on both epithelial and coccidial surface. NSU Faculty Research Grant

11:45 a.m. MED-14 Carbohydrate expression of the epithelial surface of cecum in *Eimeria* infected pheasant. T. EDWARDS (1), V. LETKOVA (2), M. GOLDOVA (2), and A.T. MARIASSY (3). (1) Barry Univ., Miami Shores, 33161, (2) Univ. of Vet. Med. Kosice, Slovakia, (3) Nova Southeastern University, Ft. Lauderdale, FL 33328. Attachment of coccidia to the specific intestinal segments is based on the interaction of carbohydrates and lectins on the parasites and the cecal epithelium. We quantified the carbohydrate expression of the colonizing *Eimeria duodenalis* with lectin probes in cecal epithelium of E. Duodenalis (5k/animal) infected pheasant chicks at 1 and 6 days post infection (p.i.) Lectin binding was detected by Avidin-Biotin, Vector KitÒ. RGB (red, green, blue) values were determined on digital images and compared by ANOVA. There were $p<0.05$ differences among lectin expression in cecal epithelium between day 1 and 6 p.i. We conclude that the pathogenesis of parasite-host interaction in coccidiosis is associated with an altered expression of carbohydrates on the both epithelial glycocalyx and *Eimeria* surface. NSU Faculty Research Grant

12:00 p.m. MED-15 Comparison of the coccidial colonization of the duodenum and cecum in the *Eimeria* Infected Pheasant J.R. SHANDS (1), R.L. BARNES (1), V. LETKOVA (2), M. GOLDOVA (2), and A.T.MARIASSY (3). (1) Barry Univ., Miami Shores, 33161, (2) Univ. of Vet. Med. Kosice, Slovakia, (3) Nova Southeastern University, Ft. Lauderdale, FL 33328. Coccidial parasitism is characterized by a specific pattern of lesions in the intestine that varies with the *Eimeria* and host species. Experimentally infected (*E. duodenalis*, 5k/animal) 12 pheasant chicks, 2 a day were examined at day1 through day 6 post infection. (p.i.) Differential counts of parasitic forms including: 1st through 3rd generations of schizonts, gametocytes & oocysts were made in H&E sections of duodenum and cecum. Counts ranged (from–to) 0-1568 of the 1st & 2nd 0-656 3rd generations of schizonts, 0-816 gametocytes and 0-32 oocyst/ duodenal section in contrast to the cecum, which contained 0-650, 3-73, 0-

47, 0-respectively. ANOVA showed statistically significant differences between the two segments. These results support the qualitative observation that the coccidia spread and colonize unequally duodenum and cecum. NSU Faculty Research Grant

12:15 p.m. MED-16 Differential muscle fiber type atrophy after denervation. S. RICHARDSON and S. SESODIA. SGMS, Barry University, 11300 NE 2nd Avenue, Miami Shores, FL 33161. Lower hindlimbs of female Wistar rats (95-100gm) were denervated by mid thigh section of the sciatic nerve. Eight, 14 and 21 days after denervation, the soleus (SOL), tibialis anterior (TA) and extensor digitorum (EDL) muscles were removed from the denervated and contralateral (CON) limbs. Muscles were frozen in melting isopentane and 10-12 μm sections cut for ATPase histochemistry to determine the fiber type and size (minimum diameter, Dmin). Differential whole muscles atrophy of denervated muscles occurred with SOL atrophying most at 8 days and being the smallest by 21 days. Fibers of all types in these muscles atrophied over the 21-day time period. Within each muscle different fiber types showed different rates of atrophy. In SOL, type 2a fibers were more atrophied (50% of CON) at 8 days than type 1 fibers (44% of CON). Additional analysis of other muscles will be presented.

12:30 p.m. MED-17 Zirconyl hematoxylin in the diagnosis of Barrett's Esophagus. J.M. McNULTY and A.A. SMITH. Barry University, Miami Shores, FL 33161. Political or economic pressure occasionally interrupts the supply of the traditional alcian blue stain for the pathognomonic goblet cells of Barrett's intestinal metaplasia of the esophagus. Alcian blue can be replaced by zirconyl hematoxylin for this purpose. Zirconyl hematoxylin stains the same cells that alcian blue does. This can be proven by staining with zirconyl hematoxylin, bleaching, and restaining with alcian blue.

12:45 p.m. MED-18 Distribution of *tuh-1* mRNA in *Drosophila* ovaries using DNA-RNA hybridization. B. THOMPSON and G. PACKERT. Barry University, Miami Shores, FL 33029. The *tumorous-head-1* (*tuh-1*) gene is located at the base of the X chromosome and approximately 20 kb of the gene have been cloned. A small 1.2 kb DNA fragment termed G5B7 has been isolated and sequenced and was used to determine the distribution of the *tuh-1* mRNA in *Drosophila* ovaries. Ovaries were isolated from the wild type Canton-S strain and from strain GA37/JC4, a fly strain that was constructed in the laboratory and is deficient for the *tuh-1* gene. This strain served as a negative control for the hybridization procedure. The staining pattern observed for the *tuh-1* gene in

the *Drosophila* ovaries during the different stages of development will be discussed. (This project was supported by NIH-MBRS SCORE GRANT SO6 GM 45455 to G. Packert)

1:00 p.m. BUSINESS MEETING: MEDICAL SCIENCES
ROSEANN S. WHITE, UCF, presiding

JOINT MEETING
PHYSICS AND SPACE SCIENCES SECTION
ENGINEERING SCIENCES SECTION

FRIDAY 9:00 a.m. – SAND KEY ROOM 220
SESSION A
AL HALL, CITY OF TALLAHASSEE, presiding

9:00 a.m. PSS-1 The fate of nitrogen in a bioreactor landfill. N.D. BERGE and D.R. REINHART. Dept. of Civil and Env. Engr., Univ. of Central Florida, P.O. Box 162993, Orlando, FL 32816. Ammonia-nitrogen exists at high concentrations in landfill leachate and is a pollutant of concern because of its persistent and toxic nature. It is possible ammonia-nitrogen is a parameter that will determine whether the landfill is biologically stable and when post-closure monitoring may end. Thus an understanding of the fate of nitrogenous compounds in landfills is critical. Of particular interest is the fate of nitrogen in bioreactor landfills. The bioreactor landfill is a new and promising trend in solid waste management in which the *in-situ* landfill environment is controlled to create an environment capable of actively degrading the readily biodegradable organic fraction of the waste. A disadvantage of this technology is an increase in the already high concentrations of ammonia-nitrogen in the leachate due mostly to accumulation over time, but also to an increase in hydrolysis of proteins. Proteins are the major source of ammonia-nitrogen. Once the proteins are hydrolyzed, ammonia-nitrogen may undergo different transformations *in-situ*. These processes may be biological (e.g. nitrification and denitrification) and/or physical/chemical (e.g. volatilization and adsorption). A review of the fate of nitrogen in a bioreactor landfill, including transformation and removal processes, will be discussed. Additionally, preliminary research results of such processes will be presented.

9:15 a.m. PSS-2 Alternative water supply strategy in a high water use area of Coastal South Carolina: an approach to water resources management. R.L. POTTS. The Colinas Group, 515 N. Virginia Avenue,

Winter Park, FL 32789. Hilton Head Island, a rapidly developing sea island off the southern coast of South Carolina, has experienced degradation of the quality of its traditional source of drinking water, the Floridan Aquifer, due to salt intrusion from the ocean. Officials therefore declared a moratorium on new water supplies from the Floridan. The South Island Public Service District (SIPSD), however, is exploring the possibility of water supplies from the deeper and unused Cretaceous Aquifer System, between 2,800 and 4,000 feet below the island. The second of two test wells shows promise: 2,500 gallons per minute (gpm) at high efficiencies, and up to 5,000 gpm otherwise. High chloride and total dissolved solids concentrations, however, will require treatment of the water.

9:30 a.m. BREAK

9:45 a.m. PSS-3 Observations of energetic radiation from triggered lightning. M. AL-DAYEH (1), V. CORBIN (1), B. WRIGHT (1), and J. JERAULD (2). (1) Florida Tech, Dept. of Physics and Space Sciences, Melbourne, FL, 32901, (2) University of Florida, Dept. of Elec. and Computer Eng., Gainesville, FL. During the summer of 2002, using a new instrument for measuring energetic radiation, observations were made less than 100 feet from triggered lightning at Camp Blanding, Florida. The instrument was designed specifically for operating in an electrically noisy environment. On 2002 July 20, 25, and September 13, several rockets were launched during thunderstorm conditions, resulting in a total of 7 triggered lightning flashes containing at least 37 return strokes into the launch tower. During these lightning events, large amounts of energetic radiation (>>10 keV) in the form of x-rays and gamma-rays and/or energetic electrons were observed just before 31 of the dart leader/return stroke sequences, depositing, on average, tens of MeV into the detector per stroke. The timing of the observed energetic radiation suggests that the mechanism that produces this radiation may involve the dart leader phase of the lightning. These results have important implications for studying runaway electrons in air and lightning research in general, since triggered lighting experiments make the detailed study of this phenomenon possible.

10:00 a.m. PSS-4 Investigation of relativistic particle bursts from Jovian magnetosphere. G. KESHISHIAN, M. ZHANG, and H. RASSOUL. Florida Tech, Dept. of Physics and Space Sciences, Melbourne, FL, 32901. The Ulysses spacecraft, launched on 6 October 1990, offers data that strongly correlates anisotropy of observed relativistic particles to Jovian sources. Inspired by these observations, we have utilized theoretical models to offer a rational explanation for the acceleration of electron, proton, and

other nucleon fluxes. In addition, we will discuss a potential "escape mechanism" for these particles from the Jovian magnetosphere.

10:15 a.m. PSS-5 Triple GEM tracking detectors for COMPASS. K. DEHMELT (1), M.C. ALTUNBAS (2), J. EHLERS (3), J. FRIEDRICH (4), B. GRUBE (4), S. KAPPLER (5), B. KETZER (4), I. KONOROV (4), S. PAUL (4), A. PLACCI (5), L. ROPELEWSKI (5), and F. SAULI (5). (1) Florida Inst. of Technology, Melbourne, FL 32901, (2) SUNY Buffalo, Amherst 11794, NY, (3) Univ. of Heidelberg, 69117 Heidelberg, Germany, (4) Technische Univ. München, 85748 Garching, Germany, (5) CERN, EP division, 1211 Geneva 23, Switzerland. For the small area tracking (SAT) region of COMPASS, a high luminosity fixed target experiment at the SPS of CERN, a set of 20 large size (31 x 31 cm2) Gas Electron Multiplier (GEM) detectors is included. The GEM detectors of COMPASS consist of three cascaded amplification stages and permit to high gain (~ 8000) and good spatial resolution (< 50 μm for MIP) at high particle fluxes, allowing to resolve multiple hits in regions with high occupancies. The readout structure is based on two-coordinate projections and yields for each track highly correlated signal amplitudes. For the 2001 run of COMPASS, a total of 14 Triple-GEM detectors have been installed. The performance of these detectors from the commissioning phase in the high-intensity μ beam will be presented.

10:30 a.m. PSS-6 Search for the quark-gluon plasma with the electromagnetic calorimeter of PHENIX at RHIC. V. VESZPREMI (1), G. DAVID (2), and L. BAKSAY (1). Florida Tech, Dept. of Physics and Space Sciences, Melbourne, FL, (2) Brookhaven National Laboratory, Upton, NY. The research institute has the largest accelerator, which is capable to produce head-on nucleus-nucleus collisions at high energy and luminosity. Its goal is to reproduce and detect a new form of matter, which is anticipated by theory, but has never been observed – the quark-gluon plasma. There are four large detectors built on the 2.4 miles long ring, which are dedicated to observe the plasma, PHENIX is one of them. In my presentation, I would like to talk about the Electromagnetic Calorimeter of PHENIX. There are two ways, based on EMCal, one can gain evidence indicating the presence of the plasma. One can search for the signal of photons coming directly from after the collision, or for that of the neutral pions, which particles are born in the cooling plasma.

10:45 a.m. BREAK

11:00 a.m. PSS-7 Measurement of the photon structure function in two-photon collisions at LEP2. G. BAKSAY and M. HOHLMANN.

Florida Tech, Dept. of Physics and Space Sciences, 150 W. University Blvd., Melbourne, FL 32901. Single-tagged events in two-photon collisions are studied in order to measure the photon structure function $F_2^{\gamma}(x,Q^2)$ with the L3 detector at CERN. The result of this analysis improves the fundamental understanding of the complex behavior of interacting photons at highest energies and provides insight into the structure of the photon. The L3 detector is unique for the study of two-photon processes because of its excellent resolution for low momentum photons and charged hadrons and because of an unbiased track trigger. With these processes, the QCD behavior both in perturbative and non-perturbative regions can be explored.

11:15 a.m. PSS-8 Light calibration system for the CMS forward Hadron calorimeter. L. ALMEIDA and M. BAARMAND. Florida Tech, Dept. of Physics and Space Sciences, 150 W. University Blvd., Melbourne, FL 32901. The Compact Muon Solenoid (CMS) detector is an essential part of the next generation experiments to be performed at CERN during the course of this decade. It consists of three large hadron calorimeters (a main one at pseudorapidity $0 \leq |\eta| \leq 3.0$ and two forwards at $3.0 \leq |\eta| \leq 5.0$). The Forward Hadron Calorimeter (HF) has two main objectives in CMS: improvement of the measurements of the missing transverse energy (E_T^{miss}) and reconstruction of forward jets. These jets give important characteristics of several physics processes; as in the case of Heavy Higgs production through WW and ZZ fusion, and even in the search of supersymmetric particles (i.e. slepton, chargino and neutralino) searches, they are the background signatures. The calibration of the HF is based on three independent hardware systems: Laser Gain Monitor, Light Emitting Diodes, and Moving Radioactive Source. These systems must deliver the required calibration to result in an overall energy scale uncertainty not to exceed 3%. During our collaboration with CMS our team developed a light calibration system for HF. I shall present its design and preliminary results from our beam test data from CERN

11:30 a.m. PSS-9 Calibration of alignment sensors for the Endcap Muon chambers of the CMS experiment. M. RIPERT, M. HOHLMANN and L. CARAWAY. Florida Tech, 150 W. University Blvd., Melbourne, FL 32901. Position-sensitive sensors with good intrinsic position resolution, no internal calibration requirements, and long-term stability are required in order to align the Endcap Muon chambers of the CMS experiment at the Large Hadron Collider. A semi-automated test bench is being developed at Florida Tech for the alignment and calibration of these components. Different types of sensors (wire-extension and linear-motion potentiometers, and photomicrosensors) are being tested and calibrated. Hardware and calibration procedure are described. This study of the sensor

performance will improve the estimation of the chamber positions in radial and angular coordinates, which will improve track reconstruction and track resolution of CMS

FRIDAY 2:00 p.m. – SAND KEY ROOM 220
SESSION B
HAMID RASSOUL, FLORIDA TECH, presiding

2:00 p.m. PSS-10 Determining the luminosity function of the galactic halo: the white dwarf database, age, and dark matter. M. RUDKIN (1), T. OSWALT (1), T. HEINZ (1), K. JOHNSTON (1), S. RAFFERTY (1), J. HOLBERG (2), and N. SILVESTRI (3). (1) Florida Tech, Dept. of Physics & Space Sciences, Melbourne, FL, 32901, (2) Univ. of Arizona, Lunar & Planetary Lab, Tucson, AZ, 85721, (3) Univ. of Washington, Dept. of Astronomy. Seattle, WA, 98195. There is an ongoing debate surrounding cool white dwarfs in the Galactic halo. This study is an effort to (1) study the white dwarf - dark matter link, (2) determine an accurate age for the Galaxy to within +/-5%, and (3) add to a publicly accessible white dwarf database. This database can be incorporated into the NASA-NSF Nearby Stars (Nstars) database that will support such NASA missions as the Space Interferometry Mission (SIM) and the Terrestrial Planet Finder (TPF).

2:15 p.m. PSS-11 Cosmic ray propagation in interstellar space. A. FARAHAT, M. ZHANG and H. RASSOUL. Florida Tech, Dept. of Physics and Space Sciences, Melbourne, FL 32901. Cosmic ray propagation in the galaxy is the key to understand the cosmic ray composition. In this research we apply the Markov stochastic processes to the computation of cosmic ray propagation through 3-dimensional galactic magnetic fields and interstellar medium. We study the cosmic ray propagation path from their source to our solar system and what will happen to the path length of these particles when it passes through the local bubble at the edge of the solar system or the high-density gas clouds in the interstellar space. The cosmic ray abundance at their source can also be calculated using the measured abundance at the solar system with the same technique. The initial results of this theoretical study will be presented, and ongoing efforts to study the average galactic magnetic field structure to allow different diffusion coefficient, parallel and perpendicular to the field, will be discussed.

2:30 p.m. PSS-12 Florida Tech's cosmic ray muon detection. G. KARAGIORGI, J. SLANKER, and M. HOHLMANN. Florida Tech, Dept. of Physics and Space Sciences, Melbourne, FL, 32901. Muons are created

in the upper atmosphere of the Earth by cosmic rays, which are mostly protons that come from deep space. When a high-energy proton hits one of the nuclei of the atmospheric gas molecules, it creates an "air shower." In an air shower, different subatomic particles are created, including pions, which then decay into muons. These highly energetic muons interact only weakly with the air and have a mean life time long enough for some to arrive the Earth's surface, where we can detect them. Using a specific setup of two plastic scintillation detectors, we will be investigating how the flux of muons originating from cosmic ray air showers varies with zenith angle. The preliminary result of this investigation will be presented.

2:45 p.m. PSS-13 Analysis of MagLev sled oscillations on a magnetic track. O. HANSON (1), A. SHURTS (1), L. CARAWAY (1), L. BAKSAY (1), and D.R. MEINKE (2). (1) Florida Tech, Physics and Space Sciences Dept., Melbourne, FL 32901, (2) Advanced Magnet Lab Inc., Palm Bay, FL 32901. MagLev, or magnetic levitation, is a technology using magnetic fields to levitate an object, or sled, as it travels down a track. Before MagLev technology can be useful, however, its vertical oscillations due to interactions between the sled's inertia and the magnetic field of the track must be under control. The MagLev track at the Florida Tech lab is approximately 45 ft. long. Using this track, we will be doing diagnostics using position sensors to determine how and how much the sled oscillates on the track, and will be using data acquisition software that we will design, in an attempt to characterize the motion of the sled, in order to fix these oscillations for future, large-scale, applications.

3:00 p.m. BREAK

3:15 p.m. PSS-14 Conceptual designs for a mars deployable greenhouse. C.L. SNYDER and J. MANTOVANI. Florida Tech, Physics and Space Sciences Department, 150 W. University Blvd., Melbourne, FL, 32901. Long before the space program was a reality, visionary thinkers have recognized Mars as a place of enormous potential. For years now, NASA has dreamed of, and taken the first steps toward, a manned Mars mission. Some even consider a manned mission to be merely a prelude to colonization. For a long visit, however, an enormous amount of infrastructure is required, not the least of which consists of food and food production. As agriculture seems to be the only viable method for producing food on Mars, the need for a greenhouse structure is virtually unavoidable for extended stays on the planet. In this paper, we will discuss the advantages and disadvantages of various design options for a Mars Deployable Greenhouse (MDG) system. We concluded that a design utilizing current TransHAB technology and a

series of internal microenvironments (pods) to be the most efficient option for the first generation of MDGs.

3:30 p.m. PSS-15 A search for period variability in the extra-solar planet HD209458. R. SAREEN, B. OCANA, and T. OSWALT. Florida Tech, 150 W. University Blvd., Melbourne, FL 32901. The planet orbiting HD 209458 was the first planet discovered by the transit method. With an inclination close to 90 degrees and a semi-major axis less than 0.1 AU, the was found to transit its star with a period of roughly 3.524 days. Over the last two and half years, there have been multiple observations of the transit all of which showing the same two percent drop in brightness at predicted time of transit. This paper presents the preliminary results of analyzing the past observational data sets of the past two and half years. Plotting the times of center of transit for a dozen observational sets has revealed that the transit is routinely occurring later than expected. This suggests that the orbital period of the planet is slightly larger than expected. We present this finding as well as our own exoplanet transit observation with the SARA 0.9m telescope at Kitt Peak. Furthermore, our preliminary assessment suggests that the orbital period is changing due to changes in the planet's orbital element.

3:45 PM JOINT BUSINESS MEETING: PHYSICS AND SPACE SCIENCES SECTION & ENGINEERING SCIENCES SECTION
AL HALL, presiding

SCIENCE TEACHING

FRIDAY 8:30 a.m. - PENSACOLA ROOM 222
ROBIN JORDAN, FLORIDA ATLANTIC UNIVERSITY, presiding

8:30 a.m. TCH-1 Who's afraid of the sciences? G.E. ELLIS. Barry University, Miami Shores, FL 33161. In support of the national science standards, improving science literacy for all, we continue to develop new lab-based courses in the sciences for non-science majors. Searching for the best practices in implementing such courses in the curriculum, Barry University is developing four (4) new offerings in this area. Two of these courses were adaptations from the literature which came from the Howard Hughes Medical Institute (HHMI) in a book titled Exploring the Biomedical Revolution. The two courses being adopted at Barry correspond to chapters in the book from HHMI. One course is called Disease Detectives and it is an adaptation from the chapter titled The Race Against Lethal Microbes (epidemiology). The second course, called The Six Senses is an adaptation

from the chapter titled Seeing, Hearing and Smelling the World. We are linking the current literature and offering non-science majors an opportunity to view the world of life sciences by exploring medical research.

8:45 a.m. TCH-2 Technology-assisted interactive learning in introductory undergraduate chemistry. M.J. ALEMAN, C.M. CONWAY, D.W. LOUDA, and J.E. HAKY. Department of Chemistry and Biochemistry, Florida Atlantic University, Boca Raton, FL 33431. We are utilizing the Classroom Performance System in our introductory chemistry classes to promote active learning and rapidly identify strengths and weaknesses in student understanding of chemical concepts. During our classes, each student uses a portable keypad to answer questions on topics related to those covered in current or previous sessions. Responses are received using an infrared device interfaced to a laptop computer, which also stores and processes these data. As each question is asked, class responses are immediately displayed using a computer projector. This allows instant feedback for the members of class as well as the instructor. The results are used to focus current and later class sessions on concepts in which poor understanding is indicated. The system thus provides a wealth of information on student understanding of specific chemical concepts in both real-time and long-term, enabling the development of a curriculum that is responsive to student needs. Examples of the use of this system will be presented.

9:00 a.m. TCH-3 Chemistry resources online: faculty & student perspectives. J.K. WILLIAMS. Department of Mathematics & Sciences, Saint Leo University, P.O. Box 6665 Saint Leo, FL. 33574. The World Wide Web (WWW) has revolutionized the way students learn. This paper discusses the chemistry web site developed at Saint Leo University and its usefulness as a learning resource for students enrolled in general and organic chemistry.

9:15 a.m. TCH-4 The art of strategic thinking: learning about organic synthesis in a small peer group format. J.K. WILLIAMS. Department of Mathematics & Sciences, Saint Leo University, P.O. Box 6665, Saint Leo, FL. 33574. Organic synthesis is one of the most difficult challenges facing the beginning organic chemistry student. This paper discusses the use of a small peer group format and its usefulness in learning the art of strategic thinking (organic synthesis). Several synthetic preparations are presented along with results & feedback from the student peer groups.

9:30 a.m.. TCH-5 Of fluents and fluxions. R.G. JORDAN. Department of Physics, Florida Atlantic University, FL 33431. In 1676 Isaac Newton asked Henry Oldenburg, Secretary of the Royal Society, to forward the following coded message to Gottfried Leibniz, 6accdæ13eff7i3l9n4o4qrr4s8t12vx, to prove that he, Newton, had discovered what today we call the calculus. Almost everyone has heard of the controversy between Newton and Leibniz that ensued over priority; however, few are aware of the differences between their approaches. Generally speaking, we are more familiar with the notation of Leibniz, so, not only will I show you the solution to this code but, to even the score, I will explain briefly Newton's version of the calculus by way of examples. (No previous knowledge of calculus required!)

9:45 a.m. TCH-6 Science teaching in the faith-oriented classroom: snares and solutions. D.W. LOVEJOY. Palm Beach Atlantic University, P.O. Box 24708, West Palm Beach, FL 33416. Science teachers in faith-related institutions face special challenges in their effort to integrate faith and learning. Knowledge of the institution's history and extent of denominational control is essential. Religious beliefs must be considered as well, along with the degree of administrative and student support for them. Above all, as the teacher navigates the many possible minefields, adherence to one's scientific integrity must be constantly in mind.

10:00 a.m. BREAK

10:15 a.m. TCH-7 Do your students need CPR? B. POLK. Rollins College, Winter Park, Fl. The goal of this work was two-fold. I wanted to increase students' mastery of the material through writing and help them to develop scientific writing skills. The experiment was conducted on my Chemistry and Society class in the fall of 2002. I taught two sections, affording a nice experimental control group. The technology investigated is called Calibrated Peer Review™ (CPR) out of UC Berkeley. (http://cpr.molsci.ucla.edu) Quoting from literature they provide, "CPR is a Web-based instructional tool that enables students to learn by writing about important topics in a course." A typical assignment involves a student reading an assigned article, writing an essay on that article, submitting it to the website, calibrating by reading essays of predetermined quality, reading three of their peer's essays and finally rereading and grading their own essay. The benefits of this approach are many, but namely the students gain repeated exposure to the material and see how reading other's works can improve their own writing. Background on the technology and the results of the experiment will be presented.

10:30 a.m. TCH-8 Do we teach them how to think? D. RAVIV. Department of Electrical Engineering, Florida Atlantic University, FL 33431. In today's marketplace there is an urgent need for innovative "out-of-the-box" thinkers with teaming, communication, and interpersonal skills. Many college courses focus on knowledge acquisition and less on thinking. In order to get students who can solve real problems, we must address the need for development and implementation of course modules in innovation and inventiveness in different disciplines, especially engineering and technology. This talk addresses some of the problems in teaching innovative problem solving and suggests some possible solutions based on experience in an undergraduate course at Florida Atlantic University titled: "Introduction to Inventive Problem Solving in Engineering". Its goal is to enhance innovative and inventive thinking abilities of undergraduate students resulting in skills that can be used in science, math, engineering and technology. [This work has been supported in part by the National Collegiate Inventors and Innovators Alliance (NCIIA), and was supported in part by a grant from the National Science Foundation, Division of Information, Robotics and Intelligent Systems, Grant # IIS-9615688.]

11:00 a.m. TCH-9 An epidemic in your classroom. B.E. ROTHSTEIN and M. GOTTFRIED. BEAM, North Miami Beach Senior High School, 1247 NE 167th Street, North Miami Beach, FL 33162. A three part experiential unit was devised to bring the field of epidemiology into classrooms without actually exposing the students to dangerous situations. Role playing potential victims and epidemiologists, the students first participate in a revamped version of an activity involving HIV case tracing. Then they act as medical detectives, following in the footsteps of Dr. Snow, an early epidemiologist, as he traced the cholera epidemic of 1854 London to its point source and stopped the epidemic. Finally, the students experience a series of flu scenarios with different susceptibilities and analyze these situations. These experiences are all tied into the videos and DVD of the December 1999 Howard Hughes Medical Institutes Holiday Lectures, "2000 and Beyond-Confronting the Microbe Menace" which are available free for educational use.

11:15 a.m. TCH-10 Correlations among GPA's, SAT's, and hourly exam scores in 1st-year biology students. J.R. MONTAGUE. SNHS-Biology, Barry University, Miami Shores, FL 33161. Data on high school GPA's, SAT scores, 1st-semester biology grades and hourly exam performance in a college biology course were collected for 200 college students (1994-2002). High school GPA and SAT scores were significant predictors of success in 1st-semester college biology, though the statistical correlations suggested considerable uncertainty in particular predictions.

11:30 a.m. BUSINESS MEETING: SCIENCE TEACHING
ROBIN JORDAN, FLORIDA ATLANTIC UNIVERSITY, presiding

SOCIAL SCIENCE

FRIDAY 9:15 a.m. – CAPE FLORIDA ROOM 316A/B
SESSION A
MARIBETH DURST, SAINT LEO UNIVERSITY, presiding

9:15 a.m. SOC-1 Event-related potential methodology: gender and alexithymia. C. BERGER, G. STARRATT, and C. STARRATT. Barry University, Miami Shores, FL 33161. Event-related potential (ERP) methodology provides unique insights into psychological processes. This presentation reviews the literature on gender effects and emotionality as they may be measured by the ERP. Gender effects have been widely studied using ERP methodology. Emotionality has most often been studied in terms of the emotional valence of the stimulus. Fewer studies have addressed emotionality as a psychological characteristic of the individual. Measures of alexithymia provide an index of emotionality that may have ERP correlates. Proposals for future research will be discussed. (Supported by NIH-NIGMS MARC U*STAR Grant, GM08021-19, Barry University)

9:30 a.m. SOC-2 The event-related potential (ERP) as a physiological measure of response to emotional visual material. E. LOPEZ, G. STARRATT, and C. STARRATT. Barry University, Miami Shores, FL 33161. It has been theorized that two independent neurological systems are activated in response to environmental signals of reward (appetitive motivation) or punishment (aversive motivation). As a physiological measure of cognition, the ERP provides a unique insight into the relationship between situational factors and brain activity. This presentation reviews the literature on perception of emotionally valenced visual stimuli and ERPs. It is hypothesized that there is a different physiological response as reflected through ERP measures to positively valenced, negatively valenced and emotionally neutral visual stimuli.

9:45 a.m. SOC-3 Women of Color: a comparison of feminist and Black identity development. H.K. ALI and L. PETERSON. Barry University, Miami Shores, FL 33161. It has been proposed that the literature on identity development for minorities is also relevant for women. Downing and Roush (1985) were the pioneer researchers who developed a model of feminist identity development for women based on Cross's (1971) theory of black identity development. Their feminist-based perspective is

based on the premise that women who live in contemporary society must first acknowledge, then struggle with and repeatedly work through their feelings about the prejudice and discrimination they experience as women. However, past research has not sufficiently addressed the issue of race in the feminist identity model in that there can be differences among women of color compared to white women.

10:00 a.m. SOC-4 Diagnosis and treatment of dissociative identity disorder: research on the controversies since publication of DSM-IV. T.C. CHRISTOPHER, E.K. KESSENICH, K.R. MEYER, and T.H. PAXTON. St. Leo Univ., St. Leo, FL 33574. Dissociative Identity Disorder (DID), formerly known as multiple personality disorder, is named by the American Psychiatric Association to be one of four main kinds of dissociative disorders. Published research on case studies and literature of DID were reviewed to examine the controversy about the validity of the diagnosis of DID and the value of the treatment. With respect to diagnosis, since 1994 there is a growing consensus that DID meets the generally acceptable criteria for any valid psychiatric diagnosis. With respect to treatment outcomes, psychotherapy combined with hypnosis is the most frequently used and most successful treatment of DID. The effectiveness has been documented by the changes in the scores on validated diagnostic tools.

10:15 a.m. BREAK

10:30 a.m. SOC-5 The event-related potential (ERP) as a physiological measure of sensitivities to reward or punishment. E.A. DRAKE, G. STARRATT, and C. STARRATT. Barry University, Miami Shores, FL 33161. It has been theorized that two independent neurological systems are activated in response to environmental signals of reward (appetitive motivation) or punishment (aversive motivation). It is further proposed that some individuals are more sensitive to punishment, while others are more sensitive to reward, and several studies have reported physiological differences on this dimension. As a physiological measure of cognition, the ERP provides a unique insight into the relationship between situational factors, individual differences and brain activity. This presentation reviews the literature on hemispheric asymmetries in the brain associated with personality dimensions, emotion, and ERPs. It is hypothesized that there is a relationship between ERP measures, sensitivity to punishment or reward, and hemispheric asymmetries.

10:45 a.m. SOC-6 Does locus of control moderate subjective distress experienced after the September 11th attack? D.M. BUDASH and C. STARRATT. Barry University, Miami Shores, FL 33161. The aim of

the present research is to determine if a relationship exists between perceived locus of control (LoC) and the experience of distress associated with the September 11th terrorist attack. Levenson's (1972) LoC instrument was used to measure internal LoC, powerful others LoC and chance LoC (I, P, & C), the tendency to believe the perceived control they have over life events. The Impact of Events Scale-Revised (IES-R) was used to assess current distress associated with the events of September 11th. Participants were 50 Barry University students ranging in age from 18 to 51 ($M = 22.84$, $SD = 5.91$). A significant relationship was obtained between chance LoC and distress ($r = .48$, $p = .01$) only. Students who had a higher tendency to believe chance controlled life events are currently experiencing more distress related to September 11th.

11:00 a.m. SOC-7 Color: an external effective cue on memory recall. W. BUTCHER. Saint Leo University, Saint Leo, FL 33574. Interest in the psychological aspects of colors has had a long history. Soldat, Sinclair & Mark (1997) demonstrated that when comparing the effects of certain colors (e.g., blue and red) on test performance, blue had a greater enhancing effect on accuracy, especially for more complex questions. The purpose of the present study was to examine the effect of four colors of paper on classroom tests. Participants were 41 female and 19 male (n=60) university students, 18 years and older, who were administered objective classroom tests printed on either blue, red, yellow, or white paper, with matching scantron answer sheets. Results indicated that yellow paper resulted in statistically significantly higher scores than white as had been predicted. Furthermore, yellow paper also produced numerically better results than blue and red, with blue being better than red, thereby offering some support to previous findings.

11:15 a.m. SOC-8 A look at the relationship between college students and their parents. R.C. AYR and L. SZUCHMAN. Barry University, Miami Shores, FL 33161. The relationship between college students and their parents accounts for different areas of a college student's life. The parent-child relationship sets an example for college students for how they choose to interact with their peers and love interests. The kind of relationship a parent has with a child affects how the parent assists him or her in career decisions, developing autonomy, and dealing with new emotions. The parent-child relationship is different for men and women. Women have more of a relationship with their parents than men. Also, upper class students have a stronger relationship with their parents than first year students.

11:30 a.m. SOC-9 Economics and the natural sciences: the rhetoric of Henry C. Carey. A.J. CRISS. University of South Florida, St. Petersburg, FL 33701. Henry C. Carey (1793-1879) is considered the first American economist. One of Carey's major works, *Principles of Social Science* (1858), is examined to investigate how he presents his economic system. Among Carey's tools of persuasion is the argument that the logic and laws of the natural (physical, life) sciences apply equally well to the social sciences (particularly economics). Examples of this technique of argument are presented and potential power of the argument is discussed.

11:45 a.m. SOC-10 Assessing animal cruelty as a predictor of interpersonal violence. R.A. FARRINGTON. Barry University, Miami Shores, FL 33161. Animal cruelty is examined as a potential indicator of interpersonal violence. Addresses the various theories that have been postulated to explain the link between cruelty to animals and subsequent acts of violence against other people. Violence as learned behavior is discussed in terms of the impact of punitive childhood history and exposure to domestic violence on the development of violence. The association between conduct disorder and animal cruelty is explored.

12:00 p.m. SOC-11 Does content really matter? Implications of framing research. E. BRAUTIGAM and L. SZUCHMAN. Barry University, Miami Shores, FL 33161. The problem solving process entails identifying the possible outcomes of a problem, taking into account the consequences of the outcomes, and choosing among the outcomes. An individual's choice of outcome may depend on the personal gain or loss that the outcome presents. Outcomes can be framed positively, describing the outcome in terms of gain, or framed negatively, describing the outcome in terms of loss. Research suggests that changes in the formulation of outcomes affect outcome preference; individuals tend to prefer positively framed outcomes. Implications of such research (e. g., its application to other domains such as that of emotional support) are discussed.

FRIDAY 2:30 p.m. . – CAPE FLORIDA ROOM 316A/B
SESSION B
MARIBETH DURST, SAINT LEO UNIVERSITY, presiding

2:30 p.m. SOC-12 Student collegiate-level, gender, & ethnicity and their effects on depression, worry, & substance abuse. A. ROSADO. Saint Leo University, Saint Leo, FL 33574. For many, collegiate life may bring uncertain situations and awkward circumstances in which the student can experience stigmatization and occasionally social rejection, particularly if

they suffer from depression, worry, and/or substance abuse, despite college level or ethnicity. The purpose of the present study was to assess the extent to which student collegiate level, gender, and ethnicity affect student depression, worry, and substance abuse. One hundred thirty-four participants completed the Beck Depression Inventory, CAGE and CAGE-AID questionnaires, and the Student Worry Questionnaire. Results indicated that class, gender and race accounted for 16.8% of the variance of the four dependent measures. Implications for the use of these instruments in college population are offered.

2:45 p.m. SOC-13 Event-related potential methodology in the study of personality. D. FLORVILLE, G. STARRATT, and C. STARRATT. Barry University, Miami Shores, FL 33161. This presentation will address the relationship between physiological measures of cognition, as indexed by event-related potentials and various factors of personality. It has been proposed by some theorists, such as Eysenck and Gray, that there are biological bases to specific personality traits. Discussion will focus on how event-related potential methodology might provide unique insights into personality constructs such as introversion and extraversion. (Supported by NIH-NIGMS MARC U*STAR Grant, GM08021-19, Barry University)

3:00 p.m. SOC-14 Skillstreaming's effectiveness in children aged eight to eleven. J.A. WILLIAMS. Saint Leo University, Saint Leo, FL 33574. School violence and aggressive violent behavior have gained national (Scott, Nelson, & Liaupsin, 2001; McInnis & Goldstein, 1997). Most violence has been postulated to observational learning. Albert Bandura developed the concept of social learning, and Arnold Goldstein revolutionized the idea of skillstreaming in 1976, which was a behavioral method. The present study included 120 children from elementary schools located in two counties in central Florida. One county used skillstreaming in their curriculum, whereas the other did not and used another method. The children ranged in age from eight to 11 years old. Respondents completed the McInnis and Goldstein's (1997) *Student Skillstreaming Checklist* three times throughout the school year.

3:15 p.m. SOC-15 Interracial dating: a look at college students' contemporary attitudes. F. TAYLOR and F. MUSCARELLA. Barry University, Miami Shores, FL 33161. A number of reasons have been offered to explain interracial dating including psychological distortions, various forms of rebellion, and love. This study will update past research and examine contemporary attitudes towards interracial dating. The study will explore differences in attitudes as a function of familial involvement, stranger involvement, peer involvement, parental attitudes, gender and race.

Participants will be 196 undergraduates who will complete three questionnaires: a demographic questionnaire, an adaptation of Korolewicz and Korolewicz (1985) Interracial Dating Preference questionnaire, and questions about the perceived reasons why people date interracially based on photographs of interracial couples.

3:30 p.m. SOC-16 Sex and the internet: online sexual activities. R. K. MARTINS and F. MUSCARELLA. Barry University, Miami Shores, FL 33161. The release of the Internet in the 1990's created a new medium through which to discuss sexuality and to engage in sexual activities. Cooper, Boies, Maheu & Greenfield (2000) describe the "Triple A Engine" of access, affordability, and anonymity, a mechanism that facilitates the use of the Internet for sexual activities. Sex on the Internet is a relatively new area of study that is lacking in research. It has been suggested that sex on the Internet ranges from normal to pathological. Few studies have demonstrated what is considered normal or pathological in terms of attitudes, behaviors and time dedication related to online sexual activities. Furthermore, both positive consequences (a sense of community, meeting new people, and safely experimenting with sexuality) and negative consequences (avoidance or neglect of a relationship and isolation) of online sexual activity have been described.

3:45 p.m. SOC-17 Identification of binge drinkers. D.L. GAWET and C. CRONIN. Saint Leo University, Saint Leo, FL 33574. Alcohol use among college students is a major concern. Binge drinking is defined as an extended period of time during which a person repeatedly administers alcohol or another substance to the point of intoxication, and gives up his/her usual activities in order to use the substance. For males, this includes drinking five or more drinks in a row, one or more times within a two-week period of time and for females it includes four or more drinks in a row, one or more times in that same time frame. Reasons for such a high consumption of alcohol include stress reduction, mood enhancement and social camaraderie. However, some students drink for the sole purpose of intoxication. Drinking to get drunk is characterized by binge drinking and is associated with alcohol related problems. This study identified individuals who are labeled as high risk binge drinkers using the Reasons for Drinking Scale.

4:00 p.m. SOC-18 The evolution and perception of female homosexual behavior in humans. A. SILER-KNOGL and F. MUSCARELLA. Barry University, Miami Shores, FL 33161. The social psychological literature indicates that homosexual behavior is perceived negatively within contemporary U.S. culture. However, historical and cross-

cultural evidence have illustrated the prevalence of homosexual behavior and variations in social perceptions of the behavior. Cross-species evidence has shown that it exists among many primates and is common among some apes. Evolutionary theory posits that female homosexual behavior evolved in humans because it had adaptive value. It is theorized that homosexual behavior reinforced cooperative alliances between females and indirectly contributed to their survival and to that of their offspring. The evolutionary model suggests that female homosexual behavior may be viewed more positively in contexts similar to that in which it evolved.

FRIDAY 2:30 p.m. – CAPE FLORIDA ROOM 316C
SESSION C
RICHARD G. BRYAN, SAINT LEO UNIVERSITY, presiding

2:30 p.m. SOC-19 The Mozart effect: music and memory. J.J. MESSER. Saint Leo University, Saint Leo, FL 33574. Students often play music, either on the radio or the television, while studying. This serves to relax them and to drown out background noise. However, researchers have found that silence is the strategy for study because this is how the tests are taken. Because of the natural behavior of students wanting music, the purpose of the present study was to examine if classical music, specifically Mozart, could be an appropriate music for studying as opposed to silence. A small sample of juvenile correctional inmates (n = 48) completed a word memory test. Half of the inmates listened to Mozart while studying, while the other half had no music. Results indicated that there was no statistically significant difference between the performance of the Mozart group and the silent group. The results indicate that Mozart is neither harmful nor beneficial for students who would like music while studying.

2:45 p.m. SOC-20 Sources of dissatisfaction at college. J. MARKS, T. MAKOSIEJ, A. PELLICER, and R. BRYAN. Saint Leo University, Saint Leo, FL 33574. A survey was administered to 52 male and female students at a small university in central Florida. The survey measured a students' locus of control (external vs. internal) and self-rated level of depression, as well as their ranking of ten possible sources of dissatisfaction. Results indicated a positive but non-significant correlation between depression and having an external locus of control, as well as a significant negative correlation between college G.P.A. and externality, as predicted. Also, upperclassmen were found to be significantly less depressed than underclassmen. Finally, the rankings of the ten potential sources of dissatisfaction in 2002 were correlated with rankings taken in 2001 and 1981. In both cases strong, positive correlations were found,

indicating that sources of dissatisfaction at college have remained fairly constant over the past two decades.

3:00 p.m. SOC-21 The relationship between religiosity & depression among college students. J.L. MARKS. Saint University, Saint Leo, FL 33574. There are few studies on the relationship between depression and religion in "healthy" young adults. Past studies only measured either depression or religious beliefs and many studies were limited to the clinically depressed and the elderly. Both groups ere confined in institutions, mainly hospitals and nursing homes. The present study involves students from a small private university in central Florida. The participants consisted of males and females from 18-25 years of age; a few are older. The researcher dispersed two questionnaires randomly to classes on the university's campus. It is hypothesized there will be a negative correlation between religious beliefs and depression, indicating that the high religiosity is related to lower depression.

3:15 p.m. SOC-22 Effects of four colors of paper on memory for lists of words. A. PELLICER, T. MAKOSIEJ, J. MARKS, and R. BRYAN. Saint Leo University, Saint Leo, FL 33574. 68 college student volunteers were given ten minutes to study a mixed list of 20 abstract and concrete words printed on white paper. 24 hours later they were tested for recall of those words using test sheets with 20 blank spaces printed on white, yellow, blue or red paper. 17 students were randomly assigned to each of the four paper color conditions. Results indicated a marginally significant effect of word type, with concrete words being better recalled than abstract words. There was also a statistically significant effect of paper color with yellow paper producing the best recall performance, followed by red and white, with blue producing the worst performance. These results may have important implications for the choice of paper color for the administration of tests and other forms, the completion of which relies on efficient memory retrieval.

3:30 p.m. SOC-23 The sociability of individuals as assessed by the Social Interaction Assessment (SIA, Wolfe, 2002). W.J. WOLFE. Saint Leo University, Saint Leo, FL 33574. It is important to understand just how certain individuals will respond to situations involving interactions with another person. The ten-item SIA was devised to measure the sociability of the participants in real life situations. These situations could range from how they engage in conversation to whether or not they enjoy communicating with others at all. The assessment is created based on a Likert-type scale format using items such as "Strongly Agree" to "Strongly Disagree." Thus far, the data has been collected from sixteen college

affiliates. The SIA showed a coefficient alpha of .8169. More data are being collected with an estimated final N of seventy-five. The goal of this study is to determine if these results will be beneficial in possibly improving the methods we use to communicate with people we know and people we are meeting for the very first time and see if there is a significant difference in interaction.

3:45 p.m. SOC-24 Interpersonal integrity and resistance to conformity. D.S. MOORE and R. BRYAN. Saint Leo University, Saint Leo, FL 33574. Integrity as a personality construct has rarely been defined or adequately measured. The research described is a continuation of studies designed to define integrity, to develop a measure of the construct, and to associate integrity with relationship behavior. This study proposes that integrity consists of Ethical Treatment (E), Clarity of Self (CL), Honesty (H), and Lack of Conformity in the Face of Criticism (LOC). CL and LOC scores were positively related to age, and the number of children of the respondent. All four subscales were positively related to the quality of the relationship with the respondents' mother, but only the CL scale was positively related to relationship with the father. E was positively related to church attendance. LOC was significantly higher for those who had experienced a painful breakup. Women scored significantly higher than men on the E subscale. Women scored significantly higher than men on the LOC subscale.

4:00 p.m. SOC-25 The relationship between gender & aggression. T. MAKOSIEJ. Saint Leo University, Saint Leo, FL 33574. The battle of the sexes has been an ongoing war for years, but men have always been thought to be more aggressive than women. The purpose of the present study was to find a direct relationship between gender and aggressive behavior among college students. Participants were 18 male and female students, and were randomly assigned into two groups. Group A viewed a violent film scene while Group B watched a non-violent scene. Both groups were then given the same questionnaire asking five questions that varied on levels of aggression. The aggression level of each student was then compared to the gender of the students. The results indicated that females were more aggressive than males and those in the nonviolent condition answered less violently on the questionnaire.

4:15 p.m. BUSINESS MEETING: SOCIAL SCIENCE
MARIBETH DURST, presiding

POSTERS: SOCIAL SCIENCES

STUDENT UNION 302, FRIDAY 8:00 a.m. – 4:00 p.m.

POS-15 The effects of matching and mismatching presence and absence of background music on free recall of concrete and abstract words. A. PELLICER. Saint Leo University, Saint Leo, FL 33574. Previous research has shown that matching external cues from training aids in memory retrieval during testing, and that concrete words are more easily recalled than abstract ones. Further research has demonstrated that music aids in the learning process by stimulating brain cells that may not have been active during the absence of the musical stimulus. The purpose of the present study was to see if presenting a musical stimulus in training and testing would aid in the retrieval of concrete and abstract words. In this study, twenty college students were asked to memorize a list of 20 words (10 abstract and 10 concrete) while listening to music (M) or silence (S). They were then tested 24 hours later to detect learning in either matching (M-M, S-S) or mismatching (M-S, S-M) conditions. The results were predicted to show that those who memorize and test in matching conditions would have higher scores than those who memorize and test in mismatching conditions, that more concrete words would be recalled than abstract ones, and the groups with music playing in both training and testing (M-M) would score higher than those who train and test in silence (S-S). No statistically significant results were found. Implications were explored.

POS-16 Personality differences in the perception of emotion. E. RAMOS and C. STARRATT. Department of Psychology, Barry University, 11300 NE 2nd Ave., Miami Shores 33161. Gray (1970) has proposed a biological model of personality traits that emphasizes individual differences in the response to emotional conditions. Recently, Torrubia developed a self-report measure based on Gray's model; the Sensitivity Punishment: Sensitivity to Reward Questionnaire (SPSRQ; Torrubia, Avila, Molto, & Caseras, 2001). This study evaluates the concurrent and predictive validity of the SPSRQ. We obtained significant correlations between SP and NEO-FFI neuroticism (.74), extroversion (-.40) and agreeableness (-.57). In addition, the high SP group rated negative slides as more positive than the low SP group. Results are consistent with Gray's model of personality. Moreover, that the SP measure has predictive value in assessing the perception of negative stimuli.

AUTHOR INDEX