

October 2001

**Carroll Lee '71 named President/Chief Operations Officer - Bangor Hydro  
- ECE Scholarship Established**

This week, Emera Inc. of Nova Scotia, completed its [acquisition of Bangor Hydro-Electric Co.](#) Several events occurred as a result. Carroll Lee, who received his UMaine Electrical Engineering BS in 1971 and MS in 1975 was promoted to President and Chief Operations Officer, former BHE President Robert Briggs retired, and the UM ECE Department received a \$100,000 endowment from the Robert N. Haskell Trust to fund [several new scholarships](#). We are especially grateful and honored to add the Carroll Lee Scholarship Fund to the Department's offerings. We believe the fund write-up says it all:



"Mr. Haskell would have been very proud of the achievements of the young engineer he brought on board in the early 1970s. ... it is the donor's wish that the scholarship should assist those applicants who appear to emulate the qualities of Mr. Lee. Besides Maine residency and academic merit, those include such qualities as integrity, humility, determination, diligence and vision."

## Computer Curriculum revision suggestions



The ECE faculty are currently considering changes to the Computer Engineering curriculum, and we want to solicit your opinions/advice:

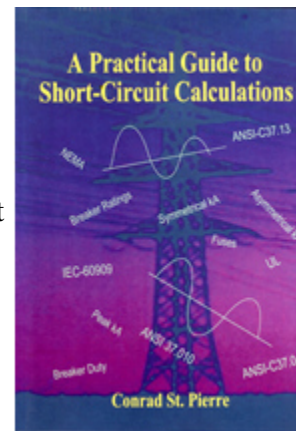
- Convert [ECE471](#) Microprocessor Applications Engineering and [ECE477](#), Hardware Applications Using C from technical electives to required courses.
- Convert [COS250](#) Discrete Structures from a required course to an elective. Some topics within COS250 will be adapted and incorporated in ECE courses.
- Introduce additional C-language content in [ECE171](#) Microcomputer Architecture & Applications.

These changes will have the effect of increasing the curricular focus on the ECE Department. We would very much appreciate receiving your comments on these proposed changes ([musavi@eece.maine.edu](mailto:musavi@eece.maine.edu)). Your feedback is an integral component of our accreditation process. Thanks.

## Alumni Profile - Conrad St. Pierre '64

Conrad St. Pierre graduated from the University of Maine with a Bachelor of Science in Electrical Engineering in 1964. He worked for General Electric, primarily in the Industrial Power Systems Engineering Operation (IPSEO), for over twenty five years. His activities included the conceptual design and system analysis of power systems for industries. His particular emphasis was on short circuit, load flow, motor starting, harmonics, impact loading, stability, and load shedding analysis of electric power systems.

*"Thirty five years ago I took the 'Electric Power' option at U of M. It was a good choice. It may not have had the glamor of the other electric engineering fields but it has served me well. Today, the demand for engineers in the electric power field is high. I frequently get asked if I know of available engineers that a company can hire, to which the answer is generally 'No' I do not. The majority of present power system engineers are near retirement with very few young engineers to fill their positions. The new engineer is almost guaranteed a position offer with one or more companies.*



*Many of the protective relays and generator controls are microprocessor based so the present-day power engineer has to know both the high power and the microprocessor application.*

*What does an 'Electric power engineer' do? With a company like GE or ABB one could be doing electric network studies, designing equipment, or selling power equipment. If you're a factory power engineer, your responsibilities would be to help ensure the equipment stays running, analyze problems, and specify equipment. With an engineering firm, you would be part of a team that would design a system or process. If these characteristics appeal to you, you should look into the electric power engineering field."*

Conrad is currently the President of Electric Power Consultants, LLC (EPC), a small engineering firm providing electric power systems analysis to a wide variety of clients. He recently wrote [A Practical Guide to Short-Circuit Calculations](#) a reference that will be used in ECE 427

## **Presidential Scholarships Program!**

**Out-of-state students receive scholarships to pay in-state rates!** UM is making awards to the top 10% of out-of-state, first-year students who have a minimum 1250 SAT. The award is based on the 6th semester high school rank and the fact that they apply for admission by December 15th. These scholarships are renewable for up to eight semesters provided the student maintains a cumulative g.p.a. of 3.0. The awards are annually worth \$7500. Out-of-state students who apply to the College of Engineering and are eligible will automatically be considered - no special application needed! **Just apply to UM! Spread the word!**

## **Research Snippets ...**



Students often wonder what faculty are doing when they aren't teaching classes. Much of the time, they're working on some very interesting problems. I thought we'd start a series of brief descriptions to give you some idea:

John Vetelino has several projects ongoing:

1. Fruit Ripening Sensor - USDA - This project involves the development of a metal oxide semiconductor sensor capable of determining when the ripening process starts in fruits. One of the fruits being examined is bananas. This type of sensor will tell farmers when to pick fruit and also enable processors to process fruits at their peak ripeness.
2. Tritium Sensor - Los Alamos - In this project surface acoustic wave technology is being used to develop a sensor to detect tritium gas. This gas is emitted as a by-product in the development of nuclear weapons.

3. Metallic Glass Devices - BAE Systems - Metallic glasses have potential as acoustic wave substrates for applications in a wide range of microwave signal processing devices. This project involves the design, fabrication and testing of metallic glass devices such as delay lines, resonators and filters.

4. Fish Pathogen Sensor - Maine Sea Grant Program - The detection of fish pathogens is critical in many aquaculture farms. Uncontrolled fish pathogen populations can kill large numbers of fish in an enclosed environment. The sensors being developed are based on bulk acoustic wave devices and will be able to detect very low concentrations of pathogens.

We'll highlight some others in future months.

### **Reminders ...**

Please don't forget these very important events or deadlines:

- [Co-op Job Fair](#), sponsored by the Student Chapter of IEEE and the Career Center
- [Salute to Prof. Mac Libbey](#) October 20 during Homecoming Weekend
- Don't forget to [sign-up](#) for the IEEE lecture/field trip to Portland to hear about the next generation of semiconductors materials to replace silicon - [carbon nanotubes](#).

### **And finally ...**

As we approach recruiting season, I thought the following samples, allegedly taken from actual resumes, might be of interest:

- "Disposed of \$2.5 billion in assets."
- "Instrumental in ruining entire operation for a Midwest manufacturer."
- "My intensity and focus are at inordinately high levels, and my ability to complete projects on time is unspeakable."
- "Education: Curses in liberal arts, curses in computer science, curses in engineering."
- "Personal: Married, 1992 Chevrolet."
- "I have an excellent track record, although I am not a horse."
- "I am a rabid typist."
- "Proven ability to track down and correct errors."
- "Personal interests: Donating blood. 15 gallons so far."
- "I have become completely paranoid, trusting completely nothing and absolutely no one."
- "References: None, I've left a path of destruction behind me."
- "Don't take the comments of my former employer too seriously, they were unappreciative beggars and slave drivers."
- "I procrastinate - especially when the task is unpleasant."

- "I am loyal to my employer at all costs. Please feel free to respond to my resume on my office voice-mail."
- "Qualifications: No education or experience."
- "Accomplishments: Oversight of entire department."

(I can claim that last one ;-)

## **Publications, proposals, etc.**

### **GRANTS RECEIVED**

- M. Musavi (40%), H. Resson (30%), G. Markowski (15%), and A. Stefanidis (15%), "Planning Workshop on Biodiversity and Ecosystem Informatics for the Indian River Lagoon, Florida," NSF, \$50,000, September 2001.
- P. Millard (30%), J. Vetelino (30%) and C. Kim (30%), "A Biosensor Platform for Detection of Fish Pathogens," Sea Grant Proposal, \$140,000, September 26.
- D. Hummels, "Demonstration of an Underwater Digital Acoustic Telemetry," US Dept Defense/Navy, \$40,411, September 30.

### **PROPOSALS SUBMITTED**

- H. Resson, "Development of Neural Network-Based Models for Chlorophyll-a-Estimation in the Gulf of Maine," Maine Space Grant Consortium, \$57,866, September 17.
- M. DaCunha and J. Vetelino, "Acoustic Surface Wave in LGX Crystals: Military Communication & Electronic Systems," DEPSCoR/Army Research Laboratory, \$480,000, September 17.
- J. Vetelino, S. Godsoe and C. Holden, "GK-12: Sensors!" NSF, \$1,691,041, September 17.
- M. DaCunha and J. Vetelino, "New Acoustic Wave Materials for High Temperature Chemical Sensors," Maine Space Grant Consortium/NASA, \$40,000, September 24.

### **PUBLICATIONS**

- J. Vetelino and C. Zhang, "Theoretical Model of an Acoustic Wave Liquid Conductivity Sensor," Chemical and Biological Sensors and Analytical Methods II, pp. 116-120, Proceedings of the International Symposium of the Electrochemical Society edited by M. Butler, P. Vanysek and N. Yamazoe, Sept. 2001.
- J. Vetelino, G. Chen, C. Zhang, D. Frankel, and R. Bushway, "The Application of a Bulk Acoustic Wave Sensor for Pesticide Detection in Liquids," Chemical and Biological Sensors and Analytical Methods II, pp. 121-124, Proceedings of the

- International Symposium of the Electrochemical Society edited by M. Butler, P. Vanysek and N. Yamazoe, Sept. 2001.
- J. Vetelino, C. Zhang, C. Kim, and P. Millard, "An Acoustic Wave Sensor for Monitoring Ammonium in Water," *Chemical and Biological Sensors and Analytical Methods II*, pp. 125-129, Proceedings of the International Symposium of the Electrochemical Society edited by M. Butler, P. Vanysek and N. Yamazoe, Sept. 2001.
  - J. Vetelino and C. Zhang, "Liquid Dielectric Constant Measurement Based on Thickness Shear Mode Quartz Resonators," *Chemical and Biological Sensors and Analytical Methods II*, pp. 609-614, Proceedings of the International Symposium of the Electrochemical Society edited by M. Butler, P. Vanysek and N. Yamazoe, Sept. 2001.
  - J. Vetelino, C. Baretto, G. Sberveglieri, I. Ricco, G. Bernhardt, and R. Lad, "Mixed Vanadium/Aluminum Oxide Films for Sensing of Organic Compounds," *Chemical and Biological Sensors and Analytical Methods II*, pp. 470-474, Proceedings of the International Symposium of the Electrochemical Society edited by M. Butler, P. Vanysek and N. Yamazoe, Sept. 2001.
  - J. Vetelino and C. Zhang, "A Bulk Acoustic Wave Resonator for Sensing Liquid Electrical Property Changes," Proceedings 2001 IEEE International Frequency Control Symposium, June 6-8, 2001, pp. 535-541.

## **PROFESSIONAL ACTIVITY**

- J. Vetelino chaired a session entitled, "Acoustic Wave Sensors," at the 2001 International Chemical Sensors Meeting, San Francisco, CA, Sept. 2-7.
- D.E. Kotecki attended the IEEE Maine section executive committee meeting in Augusta on September 12.
- J. Patton and D. Kotecki attended IEEE meeting at ATS in Sanford, Sept. 25
- F. Irons - reviewed a paper for the IEEE Transactions on Instrumentation and Measurements, October 2.

## **PRESENTATIONS**

- J. Vetelino, "Theoretical Model of an Acoustic Wave Liquid Conductivity Sensor," presented at the 2001 International Chemical Sensors Meeting, San Francisco, CA, Sept. 2-7.
- J. Vetelino, "The Application of a Bulk Acoustic Wave Sensor for Pesticide Detection in Liquids," presented at the 2001 International Chemical Sensors Meeting, San Francisco, CA, Sept. 2-7. J. Vetelino, "An Acoustic Wave Sensor for Monitoring Ammonium in Water," presented at the 2001 International Chemical Sensors Meeting, San Francisco, CA, Sept. 2-7.
- J. Vetelino, "Liquid Dielectric Constant Measurement Based on Thickness Shear Mode Quartz Resonators," presented at the 2001 International Chemical Sensors Meeting, San Francisco, CA, Sept. 2-7.

- J. Vetelino, "Mixed Vanadium/Aluminum Oxide Films for Sensing of Organic Compounds," presented at the 2001 International Chemical Sensors Meeting, San Francisco, CA, Sept. 2-7.
- J. Vetelino, "A Bulk Acoustic Wave Sensor for Sensing Liquid Electrical Property Changes," 3rd International Acoustic Sensor Workshop, Taos, New Mexico, August 29-September 1.
- C. Zhang and J. Vetelino, "Mode Interference Study of Bulk Acoustic Wave Liquid Sensors," 2001 IEEE International Symposium, Atlanta, GA, October 6-10.
- D.C. Malocha and M. Pereira Da Cunha, "Investigation of Langasite and Langanate Materials for use in SAW Device Applications," 2001 IEEE International Symposium, Atlanta, GA, October 7-12.