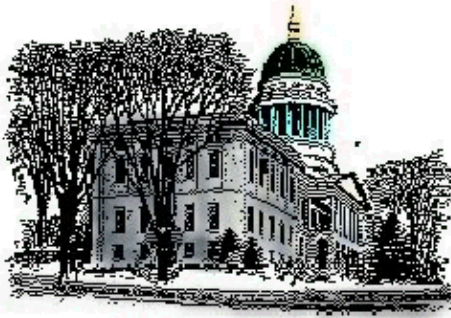


January 2001

What has been the impact of Maine-legislated R&D funding on the Department?



A few years ago, the Maine State Legislature established the Maine Economic Improvement Fund (MEIF). This fund provided a **substantial increase in research funding** for the University of Maine. Since that time, this funding has had a profound impact on the Department. We have **hired three new faculty**, who have contributed to our ability to attract funding from several sources. However, in this article, I would like to discuss some of the less obvious effects of this

research funding.

First, I think it's fair to say that without the research funding, the [Microelectronics Scholarship Consortium](#) would not exist. Over the past two years, five companies have come into the Consortium and have provided many new scholarship and coop opportunities for students. We have strengthened our ties with Fairchild Semiconductor, National Semiconductor, Tundra Semiconductor, Analog Devices, and Texas Instruments. **Without the infrastructure provided by research funding, this source of private funding would not have materialized.**

Secondly, because of the curriculum created by faculty hired with research funds, these **companies are finding it much easier to hire UMaine graduates**. More of our graduates are finding jobs in the state of Maine. Companies are finding our students to be among their most productive, loyal, and reliable employees. They tell us the turnover rate for UMaine grads is much lower than for other employees from outside the region.



Following on the research funding, an initiative was passed to provide capital improvements. Due in large part to the efforts of Dean Larryl Matthews, **a new Engineering and Science Building will open in 2003**. This **building has already allowed us to attract new faculty** candidates who would not have considered UMaine previously. The building is being designed to maximize interaction between our Department, the Laboratory for Surface Science and Technology, and the Mechanical Engineering Department. We look for this increased collaboration to yield more **synergistic and creative research** that will strengthen current and new industrial ties, open new businesses, and open up new economic opportunities for our graduates.

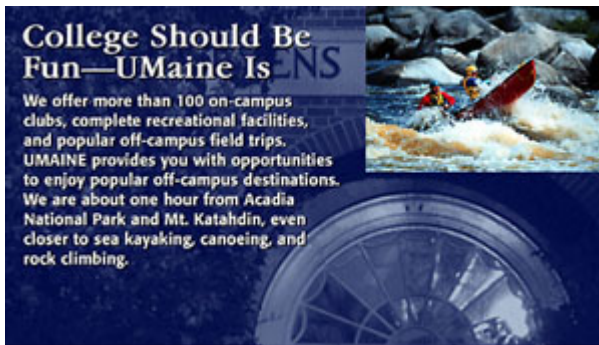
There is another research initiative under consideration before the Maine State Legislature. The "R&D II" bill will allow for \$25 million in additional support for R&D activities in the UMaine System. As the State's primary research institution, the University of Maine would get \$20 million of the package to support expanded R&D

programs. Of particular interest to the ECE Department is the [Advanced Manufacturing Center](#) (AMC). The mission of the AMC is to directly link the traditional University activities of education and research with active economic development and industrial support programs. The focus of the center will be on finding timely and innovative solutions to real-world problems in the manufacturing industry.

We encourage you to email a Maine State legislative representative to encourage them to approve this measure. Even if you live out of state, a word from you about the importance of developing this industrial infrastructure in Maine will help us tremendously. Please contact a representative, perhaps from your home town, from the [Maine State House of Representatives](#) or the [Maine State Senate](#). The AMC will be located in a renovated and expanded machine tool laboratory, between Barrows and Boardman Halls on the UMaine Campus. The facility is **scheduled to be completed by the summer of 2003**.

For more information about the AMC contact: Steve Adam, Engineering Advancement Officer, (207) 581-2262 steven.adam@umit.maine.edu.

High School students invited to ECE "sleep-over" ...



On February 18, we will host a group of high school seniors interested in learning the "real scoop" about the ECE Department from our current students. Prospective students will spend the night in the residence halls with our current students and attend a UM Open House the next day.

Here's how it will work. On Sunday afternoon, high school students and their parents will arrive. We will match the boys with male ECE student hosts and the girls with female ECE student hosts. After exchanging contact information, the high school students will leave for dinner and a party sponsored by IEEE (Institute of Electrical and Electronics Engineers student chapter). The parents will be invited to dine with faculty. The parents will be on their own for [hotel reservations](#). Next morning, high school students and parents will re-unite to participate in the UM Open House.

If you would like more information, please email or call Janice Gomm at 581-2223, janice@eece.maine.edu.

ECE101 - Jumping right in ...

Often, first-year students attending an engineering school do not get exposure to their intended major until their second year. In our Department, students are designing and building ECE projects from the beginning. And while other ECE faculty don't get to know their students until their sophomore year, we assign two full-time faculty plus a lab assistant plus peer teachers to get to know students well that critical first transition year. We believe our formula has substantially improved retention and created more opportunities for our students to succeed.



Recently an article about ECE101 was submitted to the American Society for Engineering Education. Here is a [sneak preview](#) to explain the many aspects of this innovative course, designed by Prof. Eric Beenfeldt and John Field. In a nutshell, the course includes:

- a chance to design and build an electronic controller for a mobile carrier (car)
- peer taught instruction (by upper class students) on team work, time management, and tips for transitioning from a high school to a University environment

Faculty Focus - Professor Dave Kotecki ...

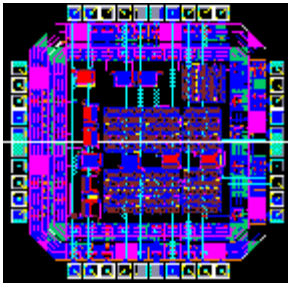


Associate Professor David E. Kotecki, e-mail: kotecki@ece.maine.edu, phone (207) 581-2248. Dr. David Kotecki joined the Electrical and Computer Engineering Department in the Fall of 1999. His academic and research interests are in the area of microelectronics. Prior to joining the faculty at UMaine, Dr. Kotecki was a Senior Engineer in the Microelectronics Division at IBM in New York, where he worked for 11 years. Dr. Kotecki has received 42 U.S. Patents for inventions related to microelectronic structures, devices, and processes and has authored or co-authored over 40 publications in these areas. He is active in the IEEE and currently serves as secretary in the Maine Section.

With financial assistance from the Vice President of Research at UMaine, Sun Microsystems, and Tundra Semiconductor, he initiated the Microelectronics Design,

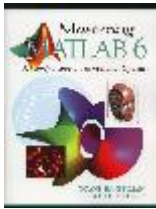


Modeling, and Simulation Laboratory. This laboratory is used for research and teaching of subjects of microelectronic devices, processing, and circuits and provides students with access to industry-standard software packages including Cadence for VLSI design and simulation, TSUPREM and Prolith for process modeling, and Atlas for design simulation. Dr. Kotecki received a grant from National Science Foundation to establish a Microelectronics Testing Laboratory for characterizing electronic materials, devices, and circuits. Work on setting up this lab is underway.



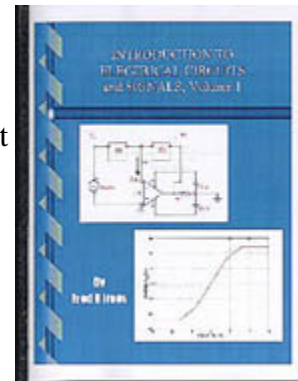
This Spring, Dr. Kotecki is teaching ECE 548, VLSI Test and Characterization, and ECE 464 which deals with the science and engineering of microelectronic fabrication. Process modeling and simulation tools are used to supplement textbook material, creating a virtual fab. This past Fall, he taught ECE 547 a course on VLSI design. As part of this class, 4 teams, consisting of 2-3 students, designed, simulated, and completed the layout of a fully custom integrated circuit. The final designs were submitted for fabrication using a 0.5um, 3 level-metal process. The IC are currently in the fabrication process and should arrive next month for testing. Dr. Kotecki is interested in strengthening the microelectronics concentration in the ECE department at UMaine and increasing the interaction of the ECE department with the microelectronic industry in the area.

New books from ECE ...



[Duane Hanselman](#) and [Bruce Littlefield](#) have just completed re-writing [Mastering MATLAB 6](#) to reflect new features in the latest version of MATLAB. A testament to the quality of their work is the fact that the staff at The MathWorks, Inc., (creators of MATLAB) use this book in the short courses they offer.

[Fred Irons](#) has just completed a re-work of his text [Introduction to Electrical Circuits and Signals](#). Fred has received many requests from former students for fresh copies of their page-worn versions. Fred reassembled this text "in honor of those students that slaved through the course". Note that this is a limited printing so don't delay if you would like a copy.



And finally ...

I'm dedicating this final section to our newest faculty member: Dr. Mauricio Pereira da Cunha, who just arrived last week. We'll formally introduce Dr. da Cunha next month.

You know you're in Maine if :

- you own more than four pair of gloves.
- every other vehicle is a 4X4.
- when the sun goes down, you start looking for your coat.
- in March your vehicle is 43% mud.
- you leave your keys in your car and the next morning your car is still there.
- you're on the shoulder of the highway with your hood up and somebody stops to help you.
- you can pay for six big macs with a personal check.
- drive by shootings only occur on the evening news.
- your central heating system is fueled by large logs.
- you see numerous chauffeur-driven dogs.
- you can see the stars at night.
- people drive 100 miles to shop in a real mall.
- a deer throws itself under your wheels.
- you got a set of new snow tires for Valentine's day.
- the bumper jack in your pickup will lift a house.
- you only paid \$5 to cut down your own douglas fir christmas tree.
- you enjoy a hot chocolate more than you do a margarita.
- a girls basketball game fills the school gym.
- you put the car heater on your list of best friends.
- you pawned a snow blower instead of a set of golf clubs.
- dressing up means wearing a tie with your flannel shirt.
- you think you're in a traffic jam when you're the second car at the light.
- you don't use your blinker because everyone already knows where you're going.

Publications, proposals, etc.

INDUSTRY/SCHOOL VISITS: DATE(S) INDUSTRY SCHOOL

Faculty/Description:

M. Musavi, H. Resson, C. Domnisoru 12/1 Jackson Laboratory
met with Dr. Gary Churchill Bar Harbor

D. E. Kotecki, M. Musavi, J. Patton 12/12 National Semiconductor
and Dean Matthews met with Portland reps on scholarships and research

D. E. Kotecki and J. Patton 12/12 Agere Systems (formerly Lucent)

S. Portland

B. Segee, B. Littlefield, A. Sheaff, R Eason, 12/18 Advanced Thermal Systems
Sanford

H. Resson and M. Musavi 1/3/01 Jackson Lab, Bar Harbor

J. Vetelino, taking ultrasonic 1/25,26 RITEC Corp, Warwick, RI
measurements for Sanders Project

GRANTS RECEIVED

D.E. Kotecki, "Electrical Characterization and Testing of Microelectronic Materials,
Devices, and Circuits," NSF, \$300,000, Jan. 1.

J.F. Vetelino (60%), R.J. Lad (25%) and M. Da Cunha (15%), "Design and Development
of Metal Glass Delay Lines," BAE Systems, \$279,667, Jan. 26.

PROPOSALS SUBMITTED

Musavi, M. (65%) and Resson, H. (35%), (ECE share \$1,088,181) "Center for
Excellence in Advanced Genomic Technologies," NIH COBRE, \$10,871,812, Jan. 12.

PUBLICATIONS

"Tapered Electrode for Stacked Capacitors," U.S. Patent 6,165,864, H. Shen, J. Nuetzel,
C.J. Radens, and D.E. Kotecki, Dec. 26.

"Integrated Circuit Having a Via and a Capacitor," U.S. Patent 6,166,423, J.P. Gambino,
M.A. Jaso, and D.E. Kotecki, Dec. 26.

"High Temperature, Conductive Thin Film Diffusion Barrier for Ceramic/metal
Systems," U.S. Patent 6,178,082, M.S. Farooq, D.E. Kotecki, R.A. Rita, and S.M.
Rossnagel, Jan. 23.

PROFESSIONAL ACTIVITY

D. E. Kotecki was elected Secretary to the Maine Section of IEEE, December 1.

F. Irons completed a review of technical paper for the IEEE Transactions on
Instrumentation and Measurement, Dec. 5.

F. Irons completed review of a manuscript for the IEEE Transactions on Instrumentation
and Measurement, Dec. 21.

M. Musavi reviewed a paper IEEE Transactions on Neural Networks, Dec. 18.

B. Segee met with other reps of Maine Technical Institute Board on precision
manufacturing, Gardiner, Jan. 19.

J. Patton and D.E. Kotecki participated in the Microelectronics Scholarship Consortium Meeting with high school students/parents, Jan. 20.

D.E. Kotecki reviewed a paper for the Journal of Vacuum Science and Technology. Jan. 23.

D.E. Kotecki attended the IEEE Executive Committee meeting, Augusta, Jan. 24.

PRESENTATIONS

J. Vetelino presented seminar, "Sensor Research at the University of Maine," Air Force Research Labs, Sigma Xi Society, Hanscom Field, MA, Jan. 24.