

March 20, 1998

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*A book is like a garden in the pocket.*

—Chinese proverb

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Vol. XXX, No.26

## Kennedy to speak on our "Environmental Destiny"

Submitted by University Cultural Enrichment



Robert F. Kennedy Jr., the 1997–98 Katherine M. Bosch speaker, will visit Michigan Tech on Wednesday, March 25. "Our Environmental Destiny: A Prescription for Common Sense Environmental Policies" is the title of his public address, scheduled for 8:00 p.m. in Fisher 135. The event is free and open to all.

Kennedy is the senior counsel for the Natural Resources Defense Council and chief prosecuting attorney for a watchdog group, the Hudson Riverkeeper Program. He is on the faculty at Pace University Law School, where he is supervising attorney and clinical professor in the Environmental Litigation Clinic.

Kennedy's reputation as a resolute defender of the environment stems from a long list of successful legal actions. Firm in his belief that a nation cannot have a sound economy without a good environmental policy, he brokered the 1995 bipartisan agreement between the EPA, New York Governor George Pataki, and New York City officials to protect the city's water supply. This agreement, which he negotiated on behalf of environmentalists and New York City watershed consumers, is regarded as an international model in stakeholder consensus negotiations and sustainable development. He also helped lead the fight to turn back the anti-environmental legislation during the 104th Congress.

He has worked on environmental issues across the Americas and has assisted several indigenous tribes in Latin America and Canada in successfully negotiating treaties protecting traditional homelands.

The heart of Kennedy's message is our responsibility and commitment to future generations. An inspiring and compelling speaker, he reminds us that "We do not inherit the Earth from our ancestors; we borrow it for our children."

This event is made possible through funding from the Katherine M. Bosch Endowment and is coordinated by the University Cultural Enrichment Department. For more information, call 487-2844.

## Computer science researcher gets \$230K to upgrade genome software

With the help of a three-year grant from the National Institutes of Health, Associate Professor **Xiaoqiu Huang** (computer science) is working on the second upgrade to his CAP sequence assembly program, used by genome researchers to find order in the huge mass of data contained in human DNA.

Huang developed CAP1 and, later, CAP2 (for contig assembly programs) so researchers could pinpoint the location of nucleotides, the four chemicals that make up DNA, on human chromosomes. Because each DNA molecule is too long to map, researchers make many copies of them, cut them up, and figure the order of the nucleotides on each fragment. Huang's software compares the fragments and figures out how they should fit back together, making it possible to determine the order the nucleotides on an entire DNA molecule.

CAP is already being used by many of the top human genome research labs, including The Institute for Genomic Research, as well as leading biotechnology companies.

Huang has received \$150,000 from NIH over the past two years and is expecting about \$80,000 in funding for the final year of the grant. "This support is enabling me to do some improvements, to make CAP faster and more efficient so it can handle an even larger amount of data," he said. "I also hope to add more features—there's additional information in the sequence fragments that I'd like to make use of in the programs."

Huang plans to field-test CAP3 in human genome research labs and then make it available for researchers' use in late 1998.

## Michigan Tech Fund seeks Merit Award nominees

If you know an outstanding senior student at Michigan Tech, consider nominating them for a Michigan Tech Merit Award.

The awards are presented annually to a senior man and woman who have demonstrated extraordinary leadership and service to the University. Recipients are given a personal memento, and their departments each receive a \$500 grant. Nominees must be full-time seniors in good standing with a minimum 2.5 GPA.

President **Curt Tompkins** will present the awards Friday, May 1.

The deadline for submitting nominations is April 17. Nomination forms are available at the Wadsworth Hall manager's office, the J. R. Van Pelt Library circulation desk, the Campus Store, and the Meese Center. You can also call Jennifer at 487-3324 to have a form sent to you.

## Students: Summer employment available in the residence halls

Residential Services Facilities is accepting applications for full-time summer custodial positions in all MTU residence halls.

To qualify, students must currently be enrolled in a college or university or plan to attend college in the fall. Preference is given to students attending or planning to attend Michigan Tech.

The positions are forty hours per week at \$5.40 per hour; some weekend work may be required.

Applications are available in any residence hall office. Application deadline is April 3. If you have any questions, call Residential Services Facilities at 487-2740.

### Safety alert:

## Evenflo infant car seats

Director of Occupational Safety and Health **Allen Niemi** passes on this caution for the parents of young children. Evenflo "On My Way" infant car seats/carriers have a serious defect that makes them unsafe to use as infant carriers.

Parents should continue using these rear-facing infant car seats, but should not use the carrying handle until new parts are installed to fix the problem. The recall involves On My Way infant car seat/carrier model numbers 207 and 492. The manufacture date and model number are located on the bottom of the seat. The car seats were sold beginning in January 1996 for about \$60 to \$70, and the car seat with stroller model for \$150 to \$175.

The red push-button assembly on each side of the seat that is used to latch and adjust the carrying handle can unexpectedly release and cause the seat to flip forward. Reported injuries to children include bruises, concussions, and skull fractures. Parents who have this car seat should call Evenflo at 800/203-2138 for the free repair kit immediately.

## Correction

The March 13 *Tech Topics* article on the proposed five-year budget for the University stated incorrectly that salary increases would amount to 24 percent over the next five years. Many thanks to Professor Emeritus **Richard Heckel**, who pointed out to *Tech Topics* in the nicest possible way that, compound interest being what it is, the average increase would be 26.6 percent over that five-year period.

## TECH TOPICS

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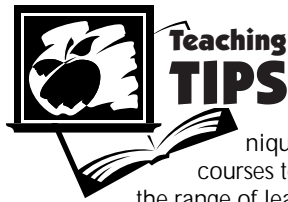
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Each week, the deadline for submitting information is **Friday at 5:00 p.m.** for publication the following Friday.

Our URL is <http://www.sas.it.mtu.edu/urel/tpics/index.html>

Center for Teaching, Learning,  
and Faculty Development



Much has been said about the importance of incorporating various teaching techniques and methods into our courses to better accommodate the range of learning styles or preferences of our students. In the mid-eighties, researcher David Kolb surmised that because many faculty members tend to be field-independent, analytical, verbal, and observational learners who learn best from lectures and classroom discussions, those are the methods that we most frequently employ in our teaching.\* By the late eighties, researchers into learning styles or preferences had developed so many different perspectives and resulting taxonomies that others felt the need to group the various models of learning styles into four general categories: personality models (extrovert/introvert), information-processing models (linear thinking v. broader conceptualizing), social-interaction models (learning oriented v. grade oriented), and instructional preference models (listening v. reading v. experiential learning, etc.)† Each of these schools of thought enjoys some following.

One learning-style model that has developed a significant following in business and higher education circles involves David Kolb's learning cycle, which posits that there are four phases of learning: (1) concretely experiencing the new activity, (2) reflecting upon the new activity, (3) abstracting or drawing generalizations from the new activity, and (4) using the generalizations to make decisions and solve problems (shades of Bloom?). Kolb identifies four different learning styles based upon the tendencies of individuals to emphasize certain phases of this learning cycle over others. According to Kolb's taxonomy, "convergers" are those who prefer to solve problems that have definite answers. They enjoy defining problems, will reason their way to a solution, and will then seek to put their solution into practice. "Divergers" are students who prefer to engage in collaborative, open reflection upon their experiences and develop a range of solutions or possibilities rather than simply finding "the" right answer. "Assimilators" are students who like the process of gathering and recasting their reflections and observations into new plans or generalizations. "Accommodators" are students who enjoy tackling problems by trial-and-error, are freely willing to take risks, and prefer a hands-on learning environment. While some teachers have used Kolb's and other learning preference taxonomies to facilitate classroom discussion and to configure student teams for various purposes, others caution that any procedures that result, intentionally or unintentionally, in the labeling of a student's predominant learning style may be problematic in that such label-

## Accommodating learning styles

by William Kennedy, director

ing ignores the fact that her/his learning preference is likely to vary situationally and/or over time.

Researchers have used taxonomies of learning preferences in subsequent research projects and have discovered that there may also be general differences in the preferred learning styles of various groups of students (using readily identifiable characteristics such as gender, age, and ethnicity). They have noted, as well, that there are obvious dangers in applying these or other generalizations to individuals based upon this sort of research.

Research into learning styles supports the position that any group of students is likely to benefit from instructional methods that accommodate learning differences through the intentional use of a variety of teaching techniques or approaches.

Apart from learning preferences, there is another important factor impacting contemporary college teaching, namely the varied levels of student preparedness. A professor can no longer assume (if they ever really could) that all (or even most) of their students will have the reading, quantitative, writing, study, or note-taking skills to succeed in their courses. Robert Menges writes of these students, "leaving [the under-prepared students] alone condemns them to almost certain failure. Most [professors] are not qualified, nor do [they] have the time, to teach them basic skills."‡ It seems that purposeful and careful coordination with our learning centers represents our best chance of helping under-prepared students get the skills they need. Students working (individually and/or in small groups) with other successful students may be the most effective way of giving under-prepared students the boost they need to succeed in the university environment.

Menges notes that with this tendency towards the deterioration of basic skills, we are facing the increasingly daunting challenge of teaching to classes with little or no "middle". One MTU professor told me that he intentionally teaches to the "bottom" of the class in hopes that the "top" students can largely fend for themselves.

Each year, it seems that we are asking more and more of ourselves. We need to know more about our students and to consider their strengths and weaknesses as we plan our classes. We feel the need to constantly adjust our teaching to better accommodate our students' widening range of talents and levels of preparation and motivation. I reflect, once again, on the words of Carnegie Professor of the Year Peter Beidler, who said, "Why do we think we deserve smart, self-motivated, hard-working, wide-awake students, students who do not really need to be taught?"

As always, we are anxious to hear your comments. Give us a call at the Center for Teaching, Learning, and Faculty Development at 487-2046.

\* Kolb and Smith, *User's Guide for the Learning Style Inventory*, Boston, McBer, 1986.

† Claxton and Murrell, "Learning Styles: Implications for Improving Educational Practices," ASHE-ERIC Higher Ed Report # 4, 1987.

‡ Robert Menges et al, *Teaching on Solid Ground: Using Scholarship to Improve Practice*, 1996, Jossey-Bass.

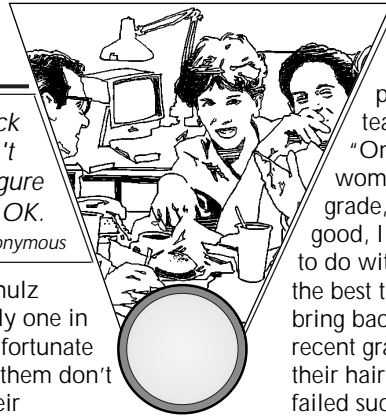
## Sexual assault task force looking for new members

Would you like to help make MTU a safer place? The MTU Sexual Assault Task Force is looking for new members. If you or anyone you know is interested, please contact Jeanine Sewell at 487-2538 or e-mail her at [jdsewell@mtu.edu](mailto:jdsewell@mtu.edu) The first meeting is on Thursday, March 19.

## Schulz: "Girls" making good in "guys' engineering"

*The difference between the male student and the female student goes back to women's characteristic of underplaying one's abilities. If a woman doesn't know something, she admits it and also believes she has far less ability to figure it out. If a man doesn't know it, he bluffs and believes he can get through it OK.*

—Anonymous



There are exceptions.

"When I was a freshman, one of the faculty I had in general engineering encouraged women to go into industrial engineering, because it had more women," **Noel Schulz** remembers. "The implication was that the women should stick together."

The other, silent implication was that the women really couldn't handle certain "guys' engineering" disciplines that were too math-oriented, too theoretical . . . too hard for girls.

"So I asked him, 'Which field has the least women?'" Schulz said.

The most-male field was, and maybe still is, electrical engineering. "I took that as a challenge," she said. "If it was a big deal to be a double E, I wanted to try that. If one was the easiest path, show me the hardest one."

Until then, Schulz, now an assistant professor in the electrical engineering department, had not noticed any barriers to her progress, other than the equal-opportunity hassles that all students face.

"But then I started to feel that there were a lot of roadblocks for women, some of them pretty direct, like that one, and others that were indirect, such as being the only woman in your class."

Luckily, she was not the only woman in her department.

"I was fortunate to have a woman faculty member who had children and was married—she had a career and a family," Schulz said. "I thought if she could do it, I could do it."

She now is working to pass on the favor. "This is a unique area, where I can contribute and relate to some of the challenges the students went through," she said. "It's harder for some of my male colleagues to do that; their experiences have been different.

"I have had the challenge of dealing with lab partners that wanted you to be the secretary, recording things rather than wiring up. I know what women are going through, and I would like to have some of the women students at Tech look at me and say, 'If Noel can do it, I can do it.'"

Schulz is among only about ten female faculty members nationwide who specialize in power engineering, and many of them are the only women in their departments. To help alleviate some of the isolation, they chat frequently via an e-mail list Schulz set up.

And sometimes, they actually meet face to face. At the IEEE Power Engineering Society Winter Meeting last February, she organized the Women in Engineering Reception. The twenty-plus attendees included women faculty, women students, women working in the power industry, and even a couple of men.

At the MTU level, Schulz has organized Women in Science and Engineering (WISE), a group of University faculty who get together about once a month.

"It's become pretty obvious that one of the things we miss is association with other

professional women," Schulz said. "Often we're the only one in our department. . . . I am fortunate to have Martha—most of them don't have senior women in their department, and this gives them an opportunity to chat with women who've had experience."

Electrical engineering professor **Martha Sloan**, the first female president of IEEE and now the first female chair of the 800,000-member American Association of Engineering Societies, remembers when having *any* women to chat with, let alone senior faculty, was a rarity.

"When I learned that there were ten women power engineering faculty in the country, I thought, 'Wow, how the world has changed.' I remember when there were fewer than ten women in all of electrical engineering," she said. "When we are worried about the number of women in specialities, we've made a lot of progress."

Such progress does not happen of its own free will. "Noel has done a lot for the department, especially in her work with women students," Sloan said. "We are extremely fortunate to have a woman so extremely talented and energetic. I hope we can attract more, so we'll always have some in the department."

To help the female EE students, Schulz is coordinating the new Women in Electrical Engineering group. "I did it so they can have somebody to talk to, a support structure if they need that," Schulz said. "I really enjoy getting to know the students on another level, watching them get through their sophomore year saying 'I don't want to be an engineer' and then seeing them graduate.

"That's why I wanted to be a teacher."

Things are definitely getting better for women, but they still pay an extra tax on their gender. "You always have to prove yourself," said **Toni Leoni**, a fourth-year electrical engineering student. "If you are the only female in a class, it's harder to ask questions, harder to get into study groups, and harder to get some professors to take you seriously."

"I worked with Noel in the Women in Engineering program, though, and it was great," she said. "You didn't have to prove yourself to her. . . . It's nice that there are people out there who trust you to do the work that you are capable of doing."

Women students tend to be harder on themselves than their male counterparts, and it helps to have a beacon when the academic seas get a little rough.

"One of the big things that has come out in a lot of studies is women do internalized failure," Schulz said. "Women with higher GPAs will switch out of engineering because they lack self-confidence. I want to give them confidence to make it through those valleys, to see their potential. I don't want roadblocks that males don't run into to keep a woman from being an engineer. We need to move the roadblocks or help them over."

Sloan agrees. "Often, if a male student gets a poor grade, he blames the teacher or the test," she said. "On the other hand, if a woman gets that same low grade, she tends to think 'I'm no good, I can't make it.' It has a lot to do with self-confidence. One of the best things we can do is to bring back to campus relatively recent grads, have them let down their hair, and say 'Boy, once I failed such and such a thing, and I was really discouraged, and then got back on track.'

"Noel is very good for them that way," Sloan added. "And she has a plan for her life. . . . It's great to see her so organized and so confident, and she's a good person to instill that in other women: Don't settle for second best; figure out what it takes to get what you really want."

**Lisann Hayes**, an electrical engineering senior, has drawn on her for inspiration. "Noel made it ten years ago," she observes. "She shows that you can succeed. And because she balances her career and her family, I know it can be done."

Women entering her field sometimes need a little extra fortitude. "I have been in classes where I was the only girl," Hayes said. "And it's kind of intimidating. You have to be comfortable around men, but that's a good thing, if you are going to be working in industry like I am.

"I was working downstate at a plant, supervising these guys that were thirty years older than me," Hayes said. "One guy was pretty difficult because I was female, but by the end of my time there, a couple of guys said, 'If you come back full time, we'll definitely work for you; we'd love to be on your crew.'"

The nurturing of students may be critical for their success, but it's not always valued by promotion and tenure committees or department chairs. Schulz considers herself fortunate in that regard. "My department has been very supportive, both [former chair] **Jon Soper** and [chair] **David Stone**," she said. "There are other places where administration is not so supportive, and if you don't have the support, you can't do it. I've been very lucky."

"If you have dedication in this area, I think you have a responsibility to share it," she adds. "There have been male mentors as well as women who have helped me make it.

"If I can give some of that back, I feel I've done my job."

## Concert Choir performs Sunday

Submitted by the

Department of Fine Arts

The Michigan Tech Concert Choir will present a concert of classic choral works on Sunday, March 22, at 7:00 p.m. in Walker Theatre.

Singing in Finnish, Russian, Latin, and English under the direction of **Milton Olsson**, chair of the fine arts department, the choir will feature music by famous composers who are known for writing forms of music other than choral, including Sibelius, Grieg, Rachmaninoff, and Bernstein.

The program will open with three sacred works. The women of the chorus will sing Verdi's "Laudi alla Vergine Maria," a beautiful adaptation of Verdi's operatic style to a moving Italian motet for treble voices. Next will be a movement from Rachmaninoff's *All Night Vigil*, "Bless the Lord, O My Soul," sung in Russian. The opening set will conclude with "Totus Tuus," an introspective, expressive work by the twentieth-century Polish composer Henryk Gorecki.

The men of the chorus, under the direction of assistant conductor **Scott Veenstra**, will perform music by Scandinavian composers. Edvard Grieg's "Brothers, Sing On!" is a popular men's glee club selection, and Jean Sibelius' setting of "Sydämeni Laulu," sung in Finnish, will be featured.

The remainder of the program will include music by Frederick Delius, Charles Ives, and an enchanting set of pieces by Philip Glass. Closing the program will be Leonard Bernstein's "Make Our Garden Grow," from *Candide*.

The Concert Choir has immediate openings for tenors and basses to prepare Mozart's Grand Mass in C Minor for performance with the Keweenaw Symphony Orchestra in May 1998. For information, call 487-2067.

Tickets for the March 22 concert are available from the SDC Ticket Office (487-2073), Memorial Union (487-3200) or Calumet Theatre (337-2610) for \$7 general, \$5 seniors, and \$3 students. Tickets are \$1 more at the door.

## Romeo and Juliet at the Calumet Theatre March 28

Submitted by University Cultural Enrichment

Who can fail to be moved by the tender love story of Romeo and Juliet? Surrounded by circumstances beyond their control, they are victims of a bitter feud between their two families. For centuries, audiences have followed the fate of the two young star-crossed lovers from their first encounter to their tragic, mistaken deaths. The MTU Committee for Campus Enrichment presents The Acting Company at the Calumet Theatre at 8:00 p.m. on Saturday, March 28, for one performance only of William Shakespeare's famous play. Tickets are on sale at the Memorial Union Box Office (487-3200, Monday-Friday, 10:00 a.m.-2:00 p.m.), the SDC Central Ticket Office (487-2073, Monday-Friday, 8:00 a.m.-6:00 p.m.), and the Calumet Theatre (337-2610, Tuesday-Saturday, 11:00 a.m.-6:00 p.m.).

The late John Houseman's The Acting Company, the official touring arm of the Kennedy Center in Washington, DC, is a regular fixture on the Great Events Series. Their polished performances, first-class sets, and costumes never fail to please. Even though the play may have been performed by The Acting Company in the past, each production has an absolutely new concept, new sets, costumes, and original music. There's always plenty to talk about at the informal discussion held in the ballroom immediately following the performance, as actors and audience members exchange ideas about the play.

Director James Bundy chose not to use an Elizabethan setting for the play because he felt that would make it less meaningful for the audience. He also decided against using a modern setting because, he says, the play was never meant to be realistic. "It's a legend," he explains, "and it always was a legend, even when it was first written. Shakespeare could have set it in England, but he chose to set it in Verona, in Italy." Bundy decided to set the play in the nineteenth century, reasoning that the clothing, architecture, music, and manners of the time are familiar enough to a twentieth-century audience to bring the play to life. Shakespeare's language, however, remains as it was written.

The visit of The Acting Company to the Calumet Theatre is made possible by funding from the MTU Committee for Campus Enrichment and the Michigan Tech Fund. Additional funding is from Arts Midwest members and friends in partnership with the National Endowment for the Arts. For more information, call University Cultural Enrichment at 487-2844.

## Jazz "Road Show" features Chic Street Man

Submitted by the Department of Fine Arts



The Jazz Lab Band will present its fourth annual "Road Show" concerts on Friday and Saturday, March 20-21, at 8:00 p.m. in Walker Theatre. Special guest on Friday night will be Chic Street Man, an urban blues vocalist, while Saturday night's show features three student combos: Jaztec, Salsa Norté, and The Basin Street Blues Brothers. All of the ensembles are directed by **Mike Irish**. Tickets are available at the Memorial Union and Student Development Complex box offices (487-3200 or 487-2073) for \$7 general, \$5 seniors, and \$3 students (\$1 more at the door).

Chic Street Man, writer, singer and guitarist, has recently appeared as artist-in-residence with the Houghton-Portage Township Schools. Chic creates music that transcends barriers of culture and attitude. He especially likes to perform for audiences that include youth and families, and inspires audiences to laugh and think about the world around them. His song "Everybody Be Yoself" conveys his message that people can feel good about themselves and come together to create a community.

The Jazz Lab Band, back from a spring break tour of downstate Michigan, will perform two different programs. Friday night, JLB presents music prepared for the University of Wisconsin-Eau Claire Jazz Festival, where the Lab Band will compete with twenty-seven other midwestern jazz groups later this month. Highlights include the percussion favorite "Bad Samba," "She Can Cook, Too!" with soloist Matt Wright, and "The Great White Also," with six instrumentalists. The Saturday program includes tour favorites such as "Sugar Buzz," a blazing blues tune, and "Two-Bone Barbeque," featuring a trombone duel between Philip Wells and Andy Grevstad.

Rounding out the Saturday concert will be three student combos. The Basin Street Blues Brothers features both New Orleans and Chicago-style Dixieland jazz, such as "Basin Street Blues" and "A Closer Walk With Thee." Salsa Norté will bring their Latin sizzle to the stage with Mongo Santamaria's version of "Watermelon Man" and the incendiary "Sing, Sing, Sing," while Jaztec will contribute "Straight No Chaser" and "All of Me" with vocalist Matt Wright.

## Library focus-group info on the Web

A presentation of the "Library of the Future" focus-group results is now available on the Web at <http://www.lib.mtu.edu/jrvp/libfuture.htm>. You may also access it through the J. Robert Van Pelt Web page, <http://www.lib.mtu.edu/jrvp/browser2/libwel2.htm> by clicking on "What's New," then again on "Library of the Future Focus Groups."

If you wish to hear about it from real people, **Becky Christianson** and **Theresa Sanderson Spence** would be happy to schedule a meeting at a time and place convenient to you. This could be at a regularly scheduled meeting or a special time in the evening. The presentation is about fifteen minutes long. Please send an e-mail message to [tspence@mtu.edu](mailto:tspence@mtu.edu) or leave a message at 487-3208.

## Women's History Month workshops March 31–April 3

Submitted by Educational Opportunity

It's back and it's better! Michigan Tech, in recognition of Women's History Month, will be celebrating its second annual Women's Week from March 31 to April 3 in Memorial Ballroom B. This year's theme, Prisms of A Woman's Mind, reflects both the diversity of and interconnectedness of the many ways women live, think, and work. As **Betty Chavis**, coordinator of outreach and multi-ethnic programs and organizer of this year's event, says, "There is a point in every woman's life in which she becomes a plumber, an electrician, a mechanic, a doctor, and an artist."

Accordingly, this year's event seeks to highlight accomplishments in the many areas that local women engage in and provide women a forum to share their hard-earned wisdom with other women (and the men who attend). Crafts, art, and other items will be on display. Presentations will focus on giving women the skills they need to be fully in charge of their everyday lives. Most importantly, however, Women's Week will give us all an opportunity to think about the contributions women make in the home, in the community, and on campus.

Lunches will be served free to noon workshop participants on Thursday and Friday, with a salad bar set for Tuesday to those attending the festivities.

The workshops and presenters are

### Tuesday, March 31

- 11:00 a.m.–noon—Find Your Axis: Kinetics of Exercise, Betty Chavis
- noon–12:30 p.m.—Salad bar
- 12:30–1:30 p.m.—Doll Art, Christa Walck (SBE)
- 2:00–2:20 p.m.—Presentation of Winners, Women's History Month Bulletin Board Contest
- 2:30–3:00 p.m.—What About Me? Lt. Col. Anna Taylor, Air Force ROTC

### Wednesday, April 1

- 10:30–11:00 a.m.—I Did It, You Can Too! Do It Yourself Wiring, Amy Murphy, dental hygienist
- 11:00 a.m.–noon—Slide show of selected works, Bette Sellars
- 11:00 a.m.–noon—Find Your Axis: Kinetics of Exercise, Betty Chavis
- 1:00–2:00 p.m.—The Real Thing: Sauna! Finnish Craft and Culture, Arja-Leena Karstu, owner of Fin-Pro
- 2:00–3:00 p.m.—Nature's Medicines, Helen Nevanpera, owner of By Nature
- 3:00–4:30 p.m.—Handwriting Secrets Revealed, Mary Zanon (IT), graphoanalyst

### Thursday, April 2

- 10:30–11:00 a.m.—I'm the One! Fire Fighting, Kerry Hicks (educational opportunity), Hancock Fire Department volunteer
- 11:00 a.m.–noon—Real Estate: Winning Strategies for Women, Swaran Mohan, of Allan's Statewide Realty

## Workshop series coming on surviving the teen years

The Employee Assistance Program is offering a free, six-session workshop, "Surviving the Teen Years," to all MTU employees and their spouses.

The workshops will be held Wednesdays from April 1 to May 6, from 6:30 to 8:30 p.m., at Grace Lutheran Church, on M-26 in South Range.

The series is designed to help families with teens build trust and communication. Parents will also learn ways to help their teenaged children deal with alcohol, drugs, peer pressure, communication, and sexuality.

For more information or to register, call The Institute at 482-4880 or e-mail [theinst@portup.com](mailto:theinst@portup.com)

- noon–4:00 p.m.—Reflexology sessions (by appointment), Reflexologist Nancy Gagnon (registrar's office)
- noon–1:00 p.m.—Money Smarts: Investment Advice by, for, and about Women, Rose Martel, investment service representative, introduction by Susan Boxer, MFC Bank. Bring your own sandwich. Soup will be provided.
- 1:45–2:45 p.m.—Find Your Axis: Kinetics of Exercise, Betty Chavis
- 3:00–4:00 p.m.—Auto Emergencies and Repair: Things Women Should Know, Christine Williams (ME-EM)

### Friday, April 3

- 9:00 a.m.–noon—Open mike: Reading and performances of women's writings
- noon–1:00 p.m.—From the Heart, A Poetry Performance and Reading, actress, poet, playwright, and inspirational thinker Regina Vincent Clark. Includes pasta bar luncheon.
- 1:30–2:00 p.m.—Working Women's Writings, Patricia Sotirin (humanities)
- 2:00–2:30 p.m.—Women in the Clergy: Joys and Challenges, Pastor Ilene Mattson of Good Shepherd Lutheran Church
- 2:30–4:00 p.m.—My Personal Imagery in Abstract Painting: A Demonstration, Mary Ann Beckwith (fine arts)
- 4:00–5:00 p.m.—Have You Forgotten the Most Important Person—Self?, Maggie, owner of Maggie's Massage Well

## Computer classes

The following classes will be offered through dL Computer Consultants. Cost of the workshops is \$60 for half-day, \$115 for full-day sessions. Sessions are limited to six participants. Custom classes can be scheduled for at least three participants. For more information or to register, contact Becky Christianson, Quality Service Education Office, at 487-2416 or [rwchrist@mtu.edu](mailto:rwchrist@mtu.edu)

- Access, Level 3: Tuesday, April 21, 9:00 a.m.–noon
- Excel, Level 1: Thursday, April 23, 9:00 a.m.–noon
- Excel, Level 2: Thursday, April 23, 1:00–4:00 p.m.
- New User class: Tuesday, April 7, 1:00–4:00 p.m.; and Saturday, April 18, 9:00 a.m.–noon
- Paradox: Thursday, April 9, 9:00 a.m.–4:00 p.m.
- Windows 95, Level 1: Saturday, April 25, 9:00 a.m.–noon
- Windows 95 or NT, Level 1: Tuesday, April 14, 9:00 a.m.–noon
- Windows 95 or NT, Level 2: Tuesday, April 14, 1:00–4:00 p.m.

## In print

Research Engineer Scientist **K. L. (Kip) Paxton II** and Research Engineer/Scientist II **X. (Scott) Huang** (IMP) published an invited feature article, "CastCon: New Approach to Manufacturing High-Performance Components from Particulate Materials," in *Powder Metallurgy*, Vol. 40, No. 4.

The Seaman Mineral Museum's Web page received recognition in a recent edition of *Mineral News*. Alan Goldstein, in his article "Minerals and the World Wide Web, Part 1," described the page as "the best of the bunch." The page, located at <http://www.geo.mtu.edu/museum>, was constructed by Adjunct Curator **John Jaszczak** (physics).

Assistant Professors **David Rudd** (SBE) and **Kelly Strong** (SBE) published an article, "A New Model of Job Training," in the *Journal of Employment Counseling*, Vol. 34, No. 3. Strong has also published three articles: "Managerial Perceptions of Change at a National Laboratory," coauthored with Richard Ringer (Illinois State University), in the *Leadership & Organizational Development Journal*, Vol. 19, No. 1; "Managing in Eastern Europe: The Challenge of Establishing Effective Organizations in Russia," coauthored by Joel Nicholson (San Francisco State University), in the *Organization Development Journal*, Vol. 16, No. 1; and "Governmental Objectives and Organizational Characteristics: A Stakeholder View of Privatization Effectiveness," coauthored by Julio De Castro, G. Dale Meyer (University of Colorado), and Klaus Uhlenbruck (University of California-San Marcos), in the *International Journal of Organizational Analysis*, Vol. 4, No. 4, Winter

(Continued on page 6)

# Nitrate reductase: a magical enzyme?

Submitted by the News Bureau

Researchers at Michigan Tech are studying an enzyme being used to clean up the environment that could help solve the global problem of excess nitrate and nitrogen nutrients in water sources.

The enzyme nitrate reductase comes from plants, where it plays a central role in nitrate acquisition and plays an essential role in the food chain.

**Wilbur Campbell** (biological sciences), professor of biochemistry and molecular biology and director of the Phytotechnology Research Center, heads a research team whose aim is to determine the structure and function of nitrate reductase. They want to create a 3-D model of the enzyme to gain understanding of how it works.

Campbell's research is currently being funded by a three-year, \$300,000 grant from the National Science Foundation. But in fact, he has been doing basic research on nitrate reductase for more than twenty years.

Nitrate reductase is in virtually every plant on earth and is a very efficient enzyme with an important job in nitrogen metabolism in plants, according to Campbell. The problem is that plants don't need much nitrate reductase to get their job done, so nature doesn't provide enough of the enzyme for scientists to determine just how it functions and what its potential may be.

Interestingly, nitrate reductase has a role in environmental biotechnology, where it is being used as a nitrate testing method. This new commercial method for testing for nitrate in water has been developed at a small biotechnology company in Lake Linden, Nitrate Elimination Co., Inc. The company was started by Campbell and his wife, Ellen, in 1993 to produce nitrate reductase using a process they licensed from Michigan Tech.

Environmental testing for nitrate often involves heavy metals like cadmium and zinc. Nitrate reductase-based nitrate testing replaces these older methods, which have potential to harm the environment, with an environmentally friendly

method that is safer for the person doing the test. The test can also be more accurate, according to Campbell. In addition, the Campbells' small company is doing research and development on an enzyme-based electronic detector for real-time continuous monitoring of nitrate in water and a method for removing nitrate from water using enzymes. The nitrate removal method could be used in homes and businesses with nitrate polluted water, which would make it fit to drink or use for the production of foods and beverages.

In an attempt to overcome the enzyme's scarcity, Campbell and other research groups are working to develop a recombinant expression process that will provide scientists with large amounts of the material.

"It's been a step-by-step process," explains Campbell. "When we first started recombinant production of nitrate reductase, we couldn't produce an entire enzyme. Now we can."

"We're studying the structure of the enzyme with the goal of understanding how it catalyzes the nitrate reduction process," says Campbell. "In the next couple of years, we hope to get extensive information about crystal structure that will help us solve the structure/function mystery. Ultimately we need to be able to produce large quantities of enzyme to use in these experiments."

In the recombinant process, scientists to clone a gene from a plant and place it into a yeast where the gene is expressed. The end result is an enzyme that is very much like the natural nitrate reductase. "This gives us capacity to produce the qualities of the enzyme we need for research," Campbell said.

Successful completion of the Michigan Tech studies will lead to a complete picture of nitrate reductase structure and function and will guide future studies of the enzyme, according to Campbell. Overall, he feels his research program is a good example of how basic research, even into an esoteric plant enzyme, has a potential payoff for society.

## In print (Continued from page 5)

PhD candidate **John Bulloch**, Associate Professor **Dave Hand**, and Presidential Professor **John Crittenden** (civil and environmental engineering) published a paper, "Model for Predicting Contaminant Removal by Adsorption within the International Space Station Water Processor: 1. Multicomponent Equilibrium Modeling," in *Water Environment Research*, Vol. 70, No. 1, 1998.

## POSITIONS AVAILABLE AT MTU

Job descriptions are available from Human Resources starting at 1:00 p.m. on Friday. You can e-mail us at JOBS@MTU.EDU and we will e-mail you the job description you request.

The following positions will be posted Friday, March 20, 1998, at 1:00 p.m. through noon, Friday, March 27, 1998, in the Human Resources Office.

Construction Engineer—Facilities Management  
Coordinator, Sponsored Billing—Research Accounting  
Custodian—Residential Services Facilities (REGULAR, PART-TIME, INTERNAL AND EXTERNAL AFSCME POSTING)

University employees are reminded to apply in writing prior to noon, Friday, March 27, 1998, to be considered as internal candidates for bargaining unit positions only. Applicants from the recall pool will be given first consideration for non-bargaining-unit positions only. Vacancy announcements are normally posted every Friday at 1:00 p.m. in the Human Resources Office. Complete job descriptions are available in the Human Resources Office or by calling 487-2280. More information regarding employment opportunities is available by calling the Job Line at 487-2895. Michigan Technological University is an equal opportunity educational institution/equal opportunity employer.

## March

### NATIONAL WOMEN'S MONTH

- 20 Friday**  
**10:00 a.m.**—Board of Control meeting—Memorial Union Ballroom  
**8:00 p.m.**—Jazz Lab Band "Road Show"—Walker Theatre
- 21 Saturday**  
**8:00 p.m.**—Jazz Lab Band "Road Show"—Walker Theatre
- 22 Sunday**  
**7:00 p.m.**—Concert Choir concert—Walker Theatre
- 25 Wednesday**  
**8:00 p.m.**—Robert F. Kennedy Jr., "Our Environmental Destiny"—Fisher 135
- 26 Thursday**  
**8:00 p.m.**—The Troupe's Comedy Show—Walker Theatre
- 27 Friday**  
**8:00 p.m.**—The Troupe's Comedy Show—Walker Theatre
- 28 Saturday**  
**8:00 p.m.**—The Troupe's Comedy Show—Walker Theatre  
**8:00 p.m.**—The Acting Company, *Romeo and Juliet*—Calumet Theatre

## On the road

The Computer Science Department Geometric Computing Group presented a paper, "A Tool for Teaching Curve Design," coauthored by graduate student **Yuan Zhao**, Associate Professor **John Lowther**, and Assistant Professor **Ching-Kuang Shene**; and a student poster, "An Interactive Surface Design," coauthored by graduate students **Yan Zhou** and **Yuan Zhao**, at the Twenty-ninth ACM SIGCSE Technical Conference on Computer Science Education, held February 25–March 1 in Atlanta. Shene also presented a paper, "Multi-threaded Programming in an Introduction to Operating Systems Course," at the same conference.

Professor **James Gale** (SBE) presented two papers, "Settlements: Evidence from Liability Cases," coauthored with Professor **Alan Brokaw** (SBE), and "Taxation of Intergenerational Agricultural Land Transfers: Efficiency, Incidence and Growth," at the 1998 Missouri Valley Economics Association annual meeting, held February 26–28 in Kansas City, Missouri. Gale also chaired the Regional Economics session and was a discussant in the Sports Economics session.