

SUMMATION

The newsletter of the Division of Natural Science and Mathematics at Morningside College, Sioux City, Iowa

SPRING 1998

New Science Center on the Horizon



When completed, the new science complex will be a major hub of all campus activities—housing nearly half of all the college's majors.

Dreams are becoming reality as Morningside Science and Math faculty pore over blueprints, pick out lab furniture, and plan classroom spaces. The new 45,000 square foot science center is the principal component of the College's "Investing for the Future" campaign. The goal for the five year campaign is \$40 million, nearly half of which has been raised to date.

When completed, the new facility will house the departments of Biology, Chemistry, and Physics. The three departments, currently located in Jones Hall, have outgrown their present location and need an updated facility to accommodate the open ended, hands on type of work being done by undergraduate science majors today.

The fifty year old Jones Hall will get a fresh look and be renovated and used for other growing departments. The

remodeled Hall, along with an updated Jacobson Computer Annex will be home to the nursing education, education, psychology, and math and computer science departments. The finished complex will house over half of all majors at the College.

For Morningside students and faculty, the new building will provide a number of research opportunities not available in the current facility. Dedicated research space will allow for collaborative research to take place during the academic year as well as the summer months. In addition to the expanded classrooms and lab space, the new facility will feature a natural history study room and large auditorium.

The study room will showcase a number of wonderful collections and will be open to the community. Topographic maps, collections of historic bird skins, insects,

plants, sea shells, and butterflies will all be displayed in the new space. The room will also be used for ecology, conservation studies, and field work. It's innovative design will feature a large *(continued page 6)*

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Summation is a semi-annual publication of science and math news at Morningside.

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1998

Andrea Madson- Major-Biology/Chemistry education has accepted a position at Schaller-Crestland Community High School in Early, IA.

1997

Brian Allen- Major-Biology is a first year student in the Physical Therapy program at the Mayo Hospital in Rochester, MN.

Rachel Barrett- Major-Secondary Ed. with certification in biology, chemistry, and physics is teaching at Sioux City West High.

Michelle Carr- Major-Biology is studying Physical Therapy at the University of Iowa.

Tom Schutz- Major-Biology is employed in the pharmacy at St. Luke's Hospital in Sioux City.

Tom Rentschler- Major-Biology is in his first year at Iowa State University School of Veterinary Medicine.

Bruce Vugteveen- Major-Chemistry is working as an industrial chemist.

1996

Dan Heller- Major-Chemistry has been accepted into the Pharmacy program at the University of Iowa.

Matt Sanford- Major-Chemistry is teaching in Japan.

Jason Santi- Major-Chemistry is working as an industrial chemist for Kind & Knox.

1995

Jason Kolbe- Major-Biology has been awarded an assistantship to study at the Iowa State University Evolutionary Biology and Ecology graduate program.

1993

Doug Rants- Major-Math/Computer Science works in the research and development division of the Principal Financial Group in Des Moines.

1992

Jon Flentgen- Major-Math/Computer Science is working as an Acuarial Student/Programmer with Lewis & Ellis.

Denise Flentgen (Bohner)- Major-Math/Computer Science is a consultant for Midwest Consulting in Kansas City.

1990

Rena Baldwin- Major-Biology is a graduate student at the University of Wyoming Rangeland and Ecology Program.

Alumni Profile: Mohammed Shahin "Proud to be a Morningsider"

If you could speak to the 1998 graduates, what would you tell them?

"Morningside is the college it ought to be. It is Morningside that is helping you build the foundation of your future success in life. So, don't forget about Morningside. Be proud to be a Morningsider."

These are the words of 1992 alumnus, Mohammed Shahin, a graduate from the Science and Math Division at Morningside with a double major in math and economics and a minor in physics.

After Morningside, Shahin obtained his MS in Industrial Engineering from The University of Nebraska, Lincoln. Currently, Shahin spends his days meeting challenges and solving problems as an Industrial Engineer with the Energizer Battery Company in Maryville, MO. He spends his nights meeting the challenges of an MBA program at Northwest Missouri State University.

Shahin says there are many fantastic people who touched his life at Morningside. The education he received here went far beyond the academic classroom and helped to equip him with the communication, problem solving, and management skills that he relies upon as an industrial engineer at Energizer.

When asked to name a faculty/staff member who was particularly important to his experience at Morningside, Shahin named 34 individuals! His response is a testimony to the spirit of teamwork and caring that Morningside preaches and practices.

As an industrial engineer Shahin finds himself involved in a variety of activities at Energizer, ranging from operations management to designing plant layouts to process design. These activities require initiative, creative problem solving, fostering and maintaining communication, and considerable technical expertise. According to Shahin, his experience at Morningside helped him develop these very skills.

What does this dynamic Morningside graduate plan for his future? Just like the mascot of his employer he plans to keep on going, and going, and going. He hopes to earn a Ph.D. in the production management field and return to Bangladesh for a leadership role in government where he can be an effective catalyst to build the economy and human resource potential of the country.

Alumni Share Expertise with Students

For the second year running, Dr. Mark Titus (1969) has come to Morningside College to teach the ELISA laboratory technique to the microbiology students. Dr. Titus and his technician, Tim Doden, have made the trip from Bayer Veterinary Diagnostics in Worthington, MN. to bring real life application to the microbiology lab. "Who better to teach this than someone who does it on a routine basis?" asks Dr. Titus, and the Morningside students agree. "It was really exciting to run into some of the research team from Bayer on a hog farm where we were working. I saw what we did in lab

actually happen in the real world," said one excited student after his Christmas break this year.

Alumna Mary Mallett (1982) also became involved in the microbiology lab this year. She generously hosted a field trip and tour of the quality control labs at Sue Bee Honey. "I never thought there was so much to know about honey!" remarked one student.

Morningside is grateful to these alumni for willingly sharing their time and talents.

Summer Student Research Program Strong at Morningside

For the last twelve years MidAmerican Energy has generously funded SEURP (science education and undergraduate research program) at Morningside College. This program provides support for summer research by Morningside science faculty and students and year around access to the Port Neal field station located sixteen miles south of Sioux City. Since its inception, 115 college students and 55 high school students have gained collaborative research experience with college faculty members.

Last year, using the free living nematode, *C. elegans*, as a genetic tool, Michele Arduengo and students Andrea Madsen and Mary Kay Schultes looked at the genetics of cell development. As a result of their research, they isolated seven new spermatogenesis mutations in the nematode. This year Michele is using the nematode to investigate the possible of toxicity and nematocidal activity of marigolds. Maybe there is a scientific basis for the rumor that marigolds are good for vegetable gardens.

Ed Shane and student Miranda Price (chemistry) and Sara Johnson (high school student) studied the binding of ubiquitous environmental pollutants, PAH (polycyclic aromatic hydrocarbons) to humic acid. This year Ed plans to continue the research and to conduct exploratory studies on the binding of DDT and DDE to humic acids. Ed Shane and Larry Martin in chemistry will also initiate a pilot study, requested by MidAmerican energy, to develop procedures for the identification of hydrocarbons in contaminated soils.

Jim Stroh in biology is starting a new study on the flora of the region. Using historic photography, original surveys and on-site surveys, he and his summer students will document the changes in land use and vegetation patterns in Stone State Park and the surrounding Loess Hills.

This year, in collaboration with Eugenia Farrar at Iowa State University, Jane Hey

in the biology department at Morningside will continue the amphibian research projects that were started last year with students Brooke Stansberry, Karla Uhler, Ryan Smith and Andrea Dohrmann (East High School). The faculty will work with Morningside students to survey northwest Iowa's roadside wetlands for amphibian diversity and malformations. Additionally they will work with Jim Stroh and students to monitor piping plover activity and nesting success at the Neal North Electric Generating Station.

SEURP provides a unique opportunity for Morningside students to gain "real world" research experience. For many students, SEURP is their first intensive research experience. The students are involved with the faculty through all aspects of the projects from planning to data collection and analysis to the presentation of research at professional meetings. SEURP thanks MidAmerican Energy for their continued support of these opportunities for undergraduates and faculty at Morningside College.

Ecology Students Explore the Desert

For three weeks in May, ecologist Jim Stroh in the biology department will lead an expedition of twelve students to several of the major deserts of North America. The goal will be to compare the diversity and abundance of plant species of the Chihuahuan, Sonoran and Mojave deserts. Students will explore Big Bend National Park, visit the Sonoran Desert National Museum, Organ Pipe Cactus National Monument and Joshua Tree National Park as well as many state parks and reserves during their trip. Housing is simple—cot camping under the moonlit sky. Students will journal daily about their activities and new plant species encountered. From their experience, they will prepare a paper comparing and contrasting the different plant communities they have sampled.

May Interim Earth Science Class Travels to the Badlands

The Earth Science class under the direction of Sue McDonald will travel to the Badlands and Black Hills of South Dakota on a three day field trip to investigate the natural history of the area. They will study rock types and their spatial relationships, observing classic folds and faults. Retired faculty member Joe Clafin will be meeting the class in Rapid City to add a biological perspective to the trip.

Morningsiders Volunteer Around Siouxland

One of the greatest resources a community has is its colleges; and the science and math faculty at Morningside contribute in a variety of ways to the Siouxland region. Morningside, together with Briar Cliff College and Western Iowa Tech, sponsors WINGS, a program designed to introduce at risk 7th and 8th grade girls to nontraditional careers that involve math and science. Faculty members Sue McDonald, Michele Arduengo, Robbie Rohlena and Daria Bossman (library) serve on the board that organizes this event. This year, for the first time, WINGS is also using female student volunteers. Morningside students who will participate this year include Amy Stiles, Ellen Harbaugh, Lori Jensen, Laurie Walsh, Rose Schultes, Kylie Wainer, Kelly Bass, and Stephanie Haak.

This fall Morningside had the privilege of hosting the Iowa Talented and Gifted Conference. Science faculty David Groh, Sue McDonald (physics) and Mary Leida (biology) assisted with the conference. David Groh talked to students about engineering careers, and Sue McDonald discussed other careers in science with the students. Mary Leida talked to the students about health science careers. Along with the faculty, several Math department graduates Jon Flentgen (1992), Denise (Bohner) Flentgen (1992), and Doug Rants (1993) participated in the program. (continued page 4)

Science Sweeps Across Campus

Science and Math Faculty Participate in Campus Wide Activities

Sue McDonald became co-director of Morningside's Interdisciplinary Honors program Fall of 1997. Sue is the first faculty member from the Natural Science and Mathematics division to hold this position. Morningside's Honors program is unique among college and university Honors programs in that it is voluntary for both students and faculty, and its format is predominantly discussion. The program encourages social and intellectual development through an open forum for the exchange of ideas between faculty and students. Weekly discussions focus on major writings and ideas that have influenced the development of world civilizations. Faculty from the Natural Science and Mathematics Division who have volunteered to lead discussions this past year include David Groh, Physics; Larry Martin, Chemistry; Randy Campbell, Computer Science; Michele Arduengo, Jane Hey, and Mary Leida Biology.

Science faculty are also participating in Morningside's Writing Across the Curriculum (WAC) program through the Friday is Writing Day forum. Michele Arduengo from Biology serves as a faculty member on the committee that organizes and promotes WAC activities. This year her genetics students led a lively discussion of James Watson's book *The Double Helix*. The students discussed research

ethics and the contributions of Rosalind Franklin to the discovery of the structure of DNA. Rich May's students from the interdisciplinary seminar course "Biology, Culture and Diversity" will also present some of their writing as part of Friday is Writing Day.

Faculty aren't the only representatives of science across the campus. Science majors are succeeding in other disciplines as well. Paul R. Niles and Karla Ann Uhlir received second prize in the WAC category of the 1997 Excellence in Writing Program for their Ecology laboratory paper "Trophic Comparison of Three Midwestern Aquatic Ecosystems." Amy Stiles was awarded two prizes in the same program; a second place prize for her essay "My Adoptive Grandma's Kitchen" and third place award for an essay written for her Popular Literature and Culture class. Kudos to these students for their excellent work!

volunteers continued...

Biology department faculty member Michele Arduengo was selected to participate in the Leadership Sioux City Program as a representative of Morningside College. Michele is also writing patient education literature for Marian Health Center in Sioux City as a volunteer science writing consultant for the hospital PR department.

Chemistry professor Ed Shane gave two talks in area high schools on "Energy Alternatives" and "Water Quality Issues", and he entertained some 125 Longfellow elementary students with a chemical magic show that wowed the 4th and 5th graders. One student even brought his father to Morningside to find out how to make "slime".

Biologist Jane Hey has presented two talks to local chapters of the Audubon Society and the Sierra Club. One talk discussed the problem of malformed frogs, and the second talk to the Sierra Club focused on environmental estrogens.

Faculty Implement Innovative New Courses

With the increasing importance of the World Wide Web, Morningside has added a new course on World Wide Web Page Design in its computer science offerings. This course has been team taught by Bill Steinman from Math/Computer Science, John Fender from Graphic Arts, and Andy Keck from the library.

Math and Physics have teamed up to create an application based approach to teaching math. Beginning next year, all students at Morningside will take Math in the Physical World. This is an interdisciplinary course at the level of college algebra that seeks to teach math along with its practical applications. The course will be team taught by a physics and a mathematics professor each semester. A physics/math lab in the new science center is designed for the course, complete with 11 student stations each with a computer and computer interfaced equipment. The students will study both physics and math in a hands-on, interactive environment designed specifically for the course.

Biochemistry and Molecular Biology Research Laboratory is a new interdisciplinary course between chemistry and biology. The course is designed to meet the interests of chemistry students who would like a biochemistry related lab experience and biology students who wish to do work in molecular biology. The lab is a research based project in which students will investigate a biochemical topic for the entire semester using standard research techniques such as DNA and protein gel electrophoresis, sequencing, PCR, cloning, DNA isolation and characterization, and enzyme activity assays. Students will keep a detailed research notebook, and at the end of the semester, they will give an oral defense of their research.

GRANTS AWARDED

To Ed Shane from Iowa Humanities Board to fund symposium on the Future of Rural Iowa; To Ed Shane and Larry Martin from the National Science Foundation for the purchase of a fourier transform infrared spectrometer; To Jane Hey and Eugenia Farrar from Iowa DNR for survey of spadefoot toad in western Iowa, and from the National Biologic Service to develop a listening survey protocol for monitoring the spadefoot toad, and from the Iowa DOT Living Roadway Trust Fund to evaluate roadside wetlands as amphibian habitats.



Dr. Mary Leida was recognized by the United Methodist Church General Board of Higher Education and Ministry for her exceptional teaching. Dr. Leida also received the prestigious Charles and Lucille Werr prize for faculty excellence in 1997.



Dr. Joseph Claflin was named ODK faculty person of the year in 1997. The award is presented by the students of the ODK national leadership honor society each year.

On a more personal note...Retired biology professor Joe Claflin is enjoying life as King of the Mountain. He and his wife Maurine reside on Edelweiss Mountain in Rapid City, SD where they are enjoying great weather, a beautiful house, and according to Joe, their very own creek in which to fish. Joe has already integrated himself into the community, by being elected president of the mountain's homeowners association (thereby making him "king of the mountain").

Those of you who know Larry Martin in our chemistry department will be interested to learn that he has gotten married! Larry was wedded to Laura Gruschow on 11/29/97. Laura is a medical technologist with Marian Health Center. Laura brings two grown children and two grandchildren with her into the family. Larry's comment on his new family? "It's the best way to have grandchildren. I did not have to go through the trauma of raising the kids first." When asked about making the decision to get married, Larry replied, "It took a long time to find someone foolish enough to marry me."

Faculty Participate in National and Regional Meetings

Science and Math faculty have been active in research and development activities. **Michele Arduengo** in biology presented her dissertation research in a platform talk at the 11th International *C. elegans* meeting in Madison, WI in June 1997. She also took her SEURP students Andrea Madsen and Mary Kay Schultes to the 6th annual Developmental Biology Symposium at the University of Minnesota in October 1997 where they presented their summer research. Michele attended the national meeting of Project Kaleidoscope in Houston and participated in Inspection 97 at the Johnson Space Center.

Jane Hey presented amphibian research at several meetings. At the 26th meeting of the American Society of Ichthyologists and Herpetologists held in June 1997, Jane presented a paper entitled "Characterizing tadpole morphs of the plains spadefoot toad, *Spea bombifrons*." She also presented a paper "Using autorecorders to optimize call surveys and monitor long term abundance of the plains spadefoot toad" at the Midwest Fish and Wildlife Conference in December 1997. Jane participated in the Loess Hills Prairie Seminar in June 1997 with a talk "Iowa's Amphibians: what are they saying?"

Sue McDonald in physics attended the Chautauqua Course on Using New Technologies for Teaching Introductory Astronomy in June 1997. Sue also presented a talk entitled "Curriculum

development for a combined college and university physics course" at the Iowa Chapter of the American Association of Physics Teachers in November 1997. She took her SEURP student, Amy Pease, to the Iowa Academy of Science in April 1997.

Ed Shane attended the Iowa Academy of Science meeting in 1997 with student, Miranda Price, who presented their SEURP research on binding of polycyclic aromatic hydrocarbons to humic acids. He plans to attend in 1998 with a second poster to follow up the 1997 research.

Larry Martin is serving on the American Chemical Society examinations committee that is writing the next standardized general, organic, and biochemistry examination.

In April 1997, Math professors **Steve Nimmo** and **Doug Swan** attended the meeting of the Iowa Chapter of the Math Association of America of which Steve Nimmo is secretary/ treasurer. They also attended the International Conference on Technology in Collegiate Math which was held in Chicago in November 1997. Doug Swan will be presenting a paper entitled "A precalculus writing and modeling project" at the April 1998 meeting of the Math Association of America (Iowa Chapter) and at the Biennial Symposium on Mathematical Modeling and Undergraduate Curriculum in June 1998.

Rohlena Accepts Position in Achievement Center

Robbie Rohlena has taken a new position within the College. She is the Director of the Achievement Center (formerly the Learning Center). Robbie replaces former director Tim Orwig who is now Assistant Dean of the College. Although Robbie will be missed in the Math/Computer Science department, the entire college will benefit from Robbie's many talents. She will still teach one course each semester for the Math department. Math/Computer Science is searching for a math educator who has experience with statistics to fill Robbie's former position.

Faculty Writers: Professional Publications

Jane Hey and Eugenia Farrar (ISU) published an article, "Carnivorous Spadefoot (*Spea bombifrons* Cope) Tadpoles and Fairy Shrimp in Western Iowa" in the *Journal of the Iowa Academy of Sciences*, 104(1):4-7.

Michele Arduengo has a review article in press, "Alzheimer's Disease: genetic links" in the *Encyclopedia of Genetics: Basics and Applications*. Knight, ed. (Salem Press, Pasadena, CA).



MORNINGSIDE

C O L L E G E

New Science Center continued...

glass window which will look out to the hall. The window will be lined with shelves for display of some of the specimens so that students can view science at work and science on display.

The auditorium will allow the College to sponsor regional and state-wide scientific, technological, agricultural, and environmental conferences. These events will expose students and faculty to research, issues, and leaders in these respective disciplines.

Architects Rick Heinz, Research Facilities Design, and Scott Kelsey, Anshen + Allen LA, have conducted several extended meetings with faculty groups and administration to refine the plans for labs, classrooms, offices, and other spaces in the new and renovated buildings.

The College's faculty are designing classroom and lab space which will accommodate new, interactive teaching styles and allow for future technologies. Spaces are also being designed to be flexible enough to allow for collaboration between disciplines. Classrooms will be equipped with multimedia capabilities and computer projection systems. All labs will have dedicated research space and Internet access. The new complex will have complete ADA accessibility and will comply with health and safety regulations through the addition of lab fume hoods and proper chemical storage.

The building timetable calls for completion of the design development phase by May 1998, and cost estimates by June 1998. The next steps toward building the

facility will not proceed until the \$9.5 million needed for construction has been pledged. If fund raising is successful, site development will take place during summer 1998, construction will begin in May 1999, and the new building should be open by August of 2000.

The changes taking place in the sciences at Morningside are exciting and absolutely crucial if we are to continue providing an excellent educational experience for our students. If you are interested in investing in this vital improvement to the College, please contact Tom Rice, Vice President of Development at (712) 274-5222 or tmr001@alpha.morningside.edu.

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