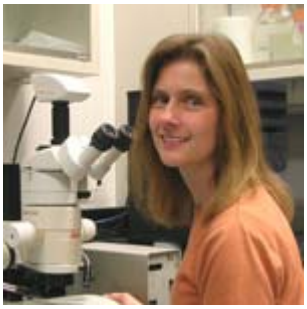
WISEST INITIATIVES / *STEM WOMEN FACULTY DEVELOPMENT*

News about STEM Women Faculty



Jennifer Schmidt, Associate Professor, Biological Sciences

7 April 2009

[UIC Biologists Use DNA to Study Migration of Threatened Whale Sharks]

Whale sharks -- giants of the fish world that strike terror only among tiny creatures like the plankton and krill they eat -- are imperiled by over-fishing of the species in parts of its ocean range.

That threat is underscored in a new study from geneticists led by Jennifer Schmidt, University of Illinois at Chicago associate professor of biological sciences, reported online today in the journal PLoS One.

Schmidt and her colleagues studied the DNA of 68 whale sharks from 11 locations across the Indian and Pacific Oceans and the Caribbean Sea -- an area that covers most of the shark's known range. Results showed little genetic variation between the populations, which indicates migration and interbreeding among far-flung populations of the big fish.

"Our data show that whale sharks found in different oceans are genetically quite similar, which means that animals move and interbreed between populations," said Schmidt. "From a conservation standpoint, it means that whale sharks in protected waters cannot be assumed to stay in those waters, but may move into areas where they may be in danger."

"The only real threat to whale sharks is us," said Schmidt. "To design proper conservation plans, we need to understand the sharks' lifestyle. We can only protect their habitat if we know what habitat they use."

With the money brought in by well-managed ecotourism programs, Schmidt said, "people in many countries have come to realize that whale sharks are more valuable alive than dead."

The research was funded by UIC and the Shark Research Institute in Princeton, N.J. Other authors of the report include Marie Levine, executive director of the Shark Research Institute; Mary Ashley, professor of biological sciences at UIC; and Kevin Feldheim, director of the Pritzker Laboratory at the Field Museum in Chicago. Published on 7 April 2009 by **Insciences** based on report by P. Francuch, UIC

This news release also appeared in several other sites:

UIC biologists use DNA to study migration of threatened whale sharks

http://www.divephotoguide.com/news/scientists_use_dna_to_study_whale_shark_migration
http://www.scubacompany.nl/smf/index.php?action=recent
http://www.biology-blog.com/blogs/permalinks/4-2009/tudying-migration-of-threatened-whale-sharks.html
http://marineanimalnews.blogspot.com/2009/04/dna-used-to-study-migration-of.html
http://www.biosentients.com/page/2/

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Carol Stein
Professor, Earth and Environmental Sciences

"The sea floor may not be quite as much of a desert even as we thought maybe 20 or 10 years ago, but rather there may be a lot of locations similar to this well-studied area in terms of the water flow where there's a lot more biological activity," she said.

"We're only beginning to really understand the interplay of the water flow and the nature of the ecosystem on the sea floor," said Stein. "I think as we move away from the ridge crests, understand what's going in the overall ocean, we'll have a better understanding of how life is distributed and affects the oceans and our planet."

24 September 2008

Ocean Floor Geysers Warm Flowing Sea Water

An international team of earth scientists report movement of warmed sea water through the flat, Pacific Ocean floor off Costa Rica. The movement is greater than that off mid-ocean volcanic ridges. The finding suggests possible marine life in a part of the ocean once considered barren.

Carol Stein, professor of earth and environmental sciences at the University of Illinois at Chicago, is a member of the research team that has studied the region, located between 50 and 150 miles offshore and covering an area the size of Connecticut. The sea floor, some two miles below, is marked by a collection of about 10 widely separated outcrops or mounts, rising from sediment covering crust made of extinct volcanic rock some 20-25 million years old.

Stein and her colleagues found that seawater on this cold ocean floor is flowing through cracks and crevices faster and in greater quantity than what is typically found at mid-ocean ridges formed by rising lava. Water temperatures, while not as hot as by the ridge lava outcrops, are surprisingly warm as well.

Finding so much movement in a bland area of the ocean was surprising.

"It's like finding Old Faithful in Illinois," said Stein. "When we went out to try to get a feel for how much heat was coming from the ocean floor and how much sea water might be moving through it, we found that there was much more heat than we expected at the outcrops."

The water gushing from sea floor protrusions warms as it moves through the insulated volcanic rock and picks up heat.

"It's relatively warm and may have some of the nutrients needed to support some of the life forms we see on the sea floor," said Stein. Her best guess as to why the water flows so rapidly is that it accelerates off nearby sea mounts and follows a well-connected network of cracks beneath the sea floor.

The earth scientists dropped probes from ships down to the pitch-dark ocean floor to collect temperature and heat-flow data to form images of what is happening in this area of the ocean, with water flowing down into rock, heating up and remixing below the floor sediment, and then escaping above the sea floor.

The rather flat undersea areas which Stein and her colleagues studied were thought to be lifeless, but the nutrient-enhanced warm water flows they discovered suggests this area too may be capable of supporting life.

The findings were reported in a letter printed in Nature Geoscience's September 2008 issue.

News published on 24 Sept 2008 by **Innovations-report.de** based on report by P. Francuch, UIC

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News about STEM Women Faculty

Cynthia J. Jameson Professor Emerita of Chemistry and Chemical Engineering

UIC's Woman of the Year Cynthia Jameson (left) is congratulated Friday by Mrinalini Rao, vice president for academic affairs.

from UIC News article by Christy Levy

Photos: Roberta Dupuis-Devlin

UIC News - November 19, 2008

Celebrating the Woman of the Year

When Cynthia Jameson, UIC's Woman of the Year, began her career as a university researcher in chemistry, she was one of the few females in her field. Now she mentors and encourages others. Jameson's colleagues and friends honored her at a reception where she was presented with bound volumes of her scholarly work (below). Jameson, professor emerita of chemistry and chemical engineering, was honored for her efforts in support of women in science, especially in academia.

"Many women are choosing not to go that route because they can see how difficult it is," Jameson said in an interview published in the Nov. 5 *UIC News*.

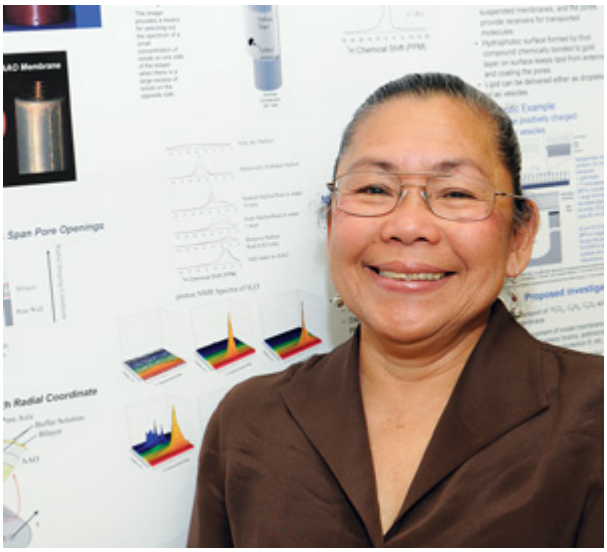
News

Woman of the Year: Cynthia Jameson
Forging a path in science

But the rewards are great, she said.

"The thing about a research career in science is that it's the kind of thing that you would do whether you get paid or not," she said. "The doing of science is sufficiently interesting and exciting, and you go from one day to the next with a lot of expectations."

The Woman of the Year Award is sponsored by the Chancellor's Committee on the Status of Women.



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D'Arcy Meyer-Dombard, Assistant Professor, Earth and Environmental Sciences

"The vast majority of microorganisms are things we've never seen before. You can also look in cold systems or deserts, where it was previously thought that no organisms lived."

D'Arcy Meyer-Dombard UIC News October 8 2008 issue

Profile: D'Arcy Meyer-Dombard finds life in unexpected places

Meyer-Dombard is fascinated by life that thrives in extreme conditions. The previous summer she was in Sicily, as well as Yellowstone. There she checked out undersea vents and hot mud from beaches where steaming gas and water seep up through the sand.

Olga Barannikova, Assistant Professor of Physics

October 6-19 2008 Strangeness in Quark Matter 2008 Beijing **Olga Barannikova** reported on the recent results of the STAR collaboration on medium properties such as Collectivity and Thermalization, Particle production and Parton propagation, Energy density & Energy loss. STAR is composed of 56 institutions from 12 countries, with a total of 619 collaborators working on the STAR experiment at the Relativistic Heavy Ion Collider at Brookhaven National Lab. STAR stands for **S**olenoidal **T**racker **A**t **R**HIC. Prof. Barannikova has been presenting several talks for the STAR collaboration (See the list of talks by the high energy physics group at UIC).

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News about STEM Women Faculty

Alina Cojocaru, Assistant Professor of Mathematics

March 12 2008
NSF CAREER Awards in MSCS
MSCS Assistant Professor Alina Cojocaru has been awarded the NSF CAREER Award for *Analytic Problems in Arithmetic Geometry* (2008-2013)
Prof. Cojocaru has also received the Gheorghe Titeica Prize .(2008) from the Romanian Academy

Laura DeMarco, Assistant Professor of Mathematics

March 12 2008
Laura DeMarco received the Alfred P. Sloan Foundation Fellowship (2008-2010): and the NSF CAREER Award on *Algebraic structures in complex dynamics*. (2008-2013)

News

See the article by P. Francuch in

UIC News Taming the chaos of complex analysis

DeMarco uses geometry and computers to help visualize the general pattern of chaotic sets, such as strangely beautiful patterns called “Julia sets.” “When a dynamical system is algebraic, such as those producing the Julia set pictures, we should try to use algebraic methods,” she said. “The main proposed research for this Career Award is to understand what is special about these algebraic systems and to study some surprising connections between this field and others where the algebra is more apparent.”

see also Featured Researcher Laura DeMarco in page 3 of CRWG Newsletter

News about STEM Women Faculty

Tanya Berger-Wolf, Assistant Professor, Computer Science

Zebras fitted with GPS tracking collars will provide researchers dynamic information on how the animals interact socially and respond to predators. The zebras will be tracked every 8 to 15 minutes, and the data will be relayed by cell phone to the researchers' computers, where new computational and analytical software tools developed as part of the project will help map and analyze the animals' social networking in ways never done before.

March 12 2008: Tanya Berger-Wolf received CAREER award
Tanya Berger-Wolf has received a five-year $505,000 National Science Foundation CAREER award to develop computational tools for population biology.

September 19 2007
News

See the article by P. Francuch in
UIC News **Researchers study zebras to better understand humans**

December 1, 2007
ScienceNews Week of Dec. 1, 2007; Vol. 172, No. 22 : Science News, a weekly magazine of science, has published an article about Prof. Berger-Wolf's work on computational analysis of social networks of zebras. The article titled **"Social Networking for Zebras"**
Scientists are developing a new branch of network theory to understand zebra communities. Tanya Berger-Wolf, is working with Dan Rubenstein of Princeton University is an ecologist who has studied zebras and other horse-like animals for 20 years.and with University of New Mexico computer scientist Jared Saia. They received a $900,000 National Science Foundation grant to create computational tools that provide a broader, more dynamic picture of animal social interactions. Berger-Wolf is redefining the most basic concepts of network theory to make them work in a graph that reflects changes over time. Even the definition of a community has to be changed for dynamic networks. In turn, the methods of collecting information has to reflect the changes over time
See also NewsWise article
September 6, 2007
Prof. Berger-Wolf Receives NSF Funding to Develop Computational Methods to Understand the Social Life of Zebras
UIC News Release (Paul Francuch)
Social Networking Software Tracks Zebras and Consumers

The tools will help researchers study the time and order of animal social interaction. The approach combines ideas from academic disciplines such as social network analysis, Internet computing, data mining and machine learning to solve the complicated puzzles of population biology.

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Anjum Ansari, Associate Professor of Physics

"We found that the time-scales on which DNA was bending were very similar to previously reported time-scales on which individual base-pairs that hold the two DNA strands together were transiently breaking. That led us to conclude that the DNA is able to bend or kink on its own, at weak points created by the transient opening of base-pairs, and that the protein recognizes and binds tightly to the bent DNA conformation."

December 2006

Anjum Ansari : **Gene-Bender Proteins May Sway to DNA**

To follow in real time the structural changes that accompany protein-DNA binding, Ansari and her UIC colleagues used a test protein from bacteria and applied a laser pulse lasting about 10 billionths of a second to heat up and disturb the protein-DNA complex. They watched the dynamics of the bound DNA in response to this perturbation.

Ansari's group was the first to apply the laser temperature-jump technique to study the dynamics of a protein-DNA complex.

The studies were done in collaboration with Donald Crothers, Sterling Professor Emeritus of chemistry at Yale University, who examined the protein-DNA interaction with the more traditional stopped-flow technique.

"While stopped-flow technique can capture dynamics of biomolecules occurring on millisecond time-scales or longer, the goal of this study was to extend the time-resolution down to sub-microseconds. It gave us a new time window on probing protein-DNA interactions," Ansari said.

That broader time window, obtained in combination with the stopped-flow measurements, provided the first direct observation of DNA bending when bound to a DNA-bending protein.

The findings appear in the Dec. 5 2006 issue of the Proceedings of the National Academy of Sciences.

The news is featured in Psych Central, Innovations Report, Bio-Medicine.org, and Medical News Today ; Also, in DEPARTMENT OF PHYSICS Spring Newsletter Page 4

All are based on an article by Paul Francuch, UIC