

DirtWaterCell

Special Interest Articles:

- Dr. Ferran Garcia-Pichel, Assistant Professor of Microbiology, Geomicrobiology, Microbial Ecology

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Alysia Cox collecting data at Yellowstone in 2003.

Greetings from the first issue of DirtWaterCell, the occasional newsletter of the biogeosciences at ASU. We hope this becomes your main resource for exchanging research news, keeping in tune with seminars, and staying alert to various dates and deadlines. This issue contains a feature on faculty member Ferran Garcia-Pichel, and interview with undergraduate Alysia Cox, and a profile of the analytical tools available in the Goldwater Environmental Lab.

Ferran Garcia-Pichel

ASU Geomicrobiologist Ferran Garcia-Pichel studies biogeochemistry at the scale where the action takes place right where the microbes meet the minerals.

Armed with grants from NSF and USDA, Garcia-Pichel pursues the interactions of microbes and their environment in desert springs and soil crusts. His focus is on how the make-up of the microbial population, also called community structure, responds to it's surroundings and how that response, in turn, shapes the function of the microbial ecosystem.

Soil crusts, in particular, represent habitats where life not only copes with harsh conditions but appears to modify those conditions at every opportunity. Garcia-Pichel in examining how soil crust communities fix and cycle nitrogen, which requires a merger of molecular methods with microsensors. Not only does this work involve the first major effort to establish the diversity of microbes in soil crusts, it is revealing how microbes adapt to prolonged desiccation, high salt concentration, and extreme exposure to UV radiation.

Learn more here: <http://lsweb.la.asu.edu/fgarciapichel/>



Here, the rough texture of the soil is due to microbial communities. Note the sparse vegetation and arid conditions that allow these crusts to form.

DWC Interview with Alysia Cox

DWC: You have been a Biology major and a Geology Major here at ASU. Are your interests in both, or somewhere in between?

AC: I guess I'm just interested in science and knowledge in general. I like biology because of practical applications to

human health, agriculture, and the environment. You know, humanity as a whole is trying to conscientiously live without making a huge negative impact on the environment. I like geology because I love going out to the field and trying to figure out what is going on and what has happened. I consider

fieldwork to be the most challenging intellectual activity encountered in my undergraduate career thus far. My interests in these two fields mix because I've always been an idealist, curious about life and the origin of life. A knowledge of microbiology,

Continued...

DWC Interview (Continued)

chemistry, and geology is crucial in beginning to attempt to understand life and its origins. I see it as a worthy challenge accepted.

DWC: You mention the value of fieldwork. What have you done while at ASU, and what could be done here to improve or broaden the opportunities for undergrads interested in field aspects of biogeochemistry?

AC: I have taken the Field Geology sequence here at ASU, and am currently enjoying Advanced Field. I spent two weeks at Yellowstone this past

summer investigating the limits of microbial photosynthesis in hot spring ecosystems with GEOPIG (Group Exploring Organic Processes In Geochemistry). I think improving awareness that there are opportunities to study biogeochemistry in the field here at ASU is a step in the right direction, and the responsibility of spreading awareness lies with those doing the science. I found out about the GEOPIG group by the e-mail Dr. Shock sent out about opening his lab last semester, and talking to my professors. I do

think, however, that a small poster symposium, or series of short presentations, by both students and professors studying field biogeochemistry, aimed towards informing undergraduates about available opportunities would be effective in spreading awareness and getting people interested in doing field biogeochemistry.

DWC: That's a great idea. Stay tuned!

Profile – Goldwater Environmental Lab



Many ASU researchers in biogeochemistry are aware of the analytical facilities in the Goldwater Environmental Lab. But for those who aren't, a wide variety of tools are available for compound, element and isotopic analysis. The following instruments are available to all ASU researchers:

- Varian Saturn Ion-Trap GC/MS/MS
- Dionex 4000i Ion Chromatograph
- Perkin-Elmer 2400 Series II CHNS/O Analyzer
- PDZ-Europa Hydra

GSL 20/20 Isotope Ratio Mass Spectrometer

- Varian SpectrAA 400 Flame Atomic Absorption Spectrometer
- Varian SpectrAA 400 Zeeman Graphite Furnace Atomic Absorption Spectrometer
- Hitachi U-2010 UV/Visible Spectrophotometer
- Lachat Quick Chem 8000 Flow Injection Analyzer
- Shimadzu TOC-5000 Total Organic Carbon Analyzer
- Bran-Luebbe TrAAcs 800 Autoanalyzer

The Goldwater

Environmental Lab operates under the direction of Thomas Colella, 965-6298, t.colella@asu.edu. It is located on the sixth floor of the Goldwater Center for Engineering Research. The facility encompasses seven laboratories (rooms 635, 637, 639, 669, 673, 675 and 677) and is part of the College of Liberal Arts and Sciences Bioresources cluster. For more information on the instruments, other equipment and fee schedule please visit the website at: <http://www.asu.edu/gel/index.html>

Upcoming Events

Thursday, October 2, 2003

"Disease Control and West Nile Virus," 3:15 p.m., Life Sciences Center (LS) E-104, ASU Main Campus, Tempe. Speaker: Dr. Robert England, Arizona State Epidemiologist. Sponsored by School of Life Sciences.

"New Vistas in Photosynthesis Research: Renewable Energy, Biosensors, and Artificial Sight," 4 p.m., Bateman Physical Sciences Center (PS) H-152, Speaker: Elias Greenbaum, Oakridge National Laboratory. Sponsored by the Biomolecular Nanotechnology IGERT program and the Photosynthesis Center.

Monday, October 6, 2003

"Seeing and Shaping the Microscopic World With Multiphoton Absorption," 3 p.m., Bateman Physical Sciences Center (PS) H-150, Speaker: John Fourkas, Department of Chemistry, Boston College. Sponsored by Department of Chemistry and Biochemistry.

"Genetic Analysis of Parkinson's Disease," 4:40 p.m., Life Sciences Center (LS) E-104, Speaker: Andrew Singleton, National Institute on Aging, NIH. Sponsored by Department of Molecular and Cellular Biology.

Wednesday, October 8, 2003

"The Mars Exploration Rover Mission," 3:40 p.m., Bateman Physical Sciences Center (PS) F-101, Speaker: Steve Squyres, Cornell University. Sponsored by Department of Geological Sciences.

Friday, October 10, 2003

"Correlated Activity Between Nuclei of the Basal Ganglia," 12:15 p.m., Schwada Classroom Office Building (SCOB) Room 152, Speaker: Steve Helms-Tillery. Sponsored by Harrington Department of Bioengineering.

"Corticosterone, behaviour and stress in Adelie penguins in Antarctica," 2:00p.m., LSE 104, Speaker: Dr. John Cockrem, Massey University, Institute of Veterinary, Animal & Biomedical Sciences. Sponsored by the School of Life Sciences

Monday, October 13, 2003

"The Atmospheric Chemistry Experiment (ACE): Spectroscopy from Orbit," 3 p.m., Bateman Physical Sciences Center (PS) H-151, Speaker: Peter Bernath, Department of Chemistry, University of Waterloo. Sponsored by Department of Chemistry and Biochemistry.

Wednesday, October 15, 2003

"Chemistry and Dynamics of Earth's Upper Mantle from Seismology," 3:40 p.m., Bateman Physical Sciences Center (PS) F-101, Speaker: Megan Flanagan, Lawrence Livermore National Laboratory. Sponsored by Department of Geological Sciences.

Friday, October 17, 2003

"Neural and Computational Mechanisms of Motor Learning," 4:40 p.m., Computing Commons (CPCOM) Room 120, Speaker: Fernando Mussa-Ivaldi, Department of Physiology, Northwestern University. Sponsored by Harrington Department of Bioengineering.

"Alpha-synuclein and Parkinson's disease," 2:00 p.m., LSE 104, Speaker: Dr. Vladimir N. Uversky, Department of Chemistry and Biochemistry University of California, Santa Cruz. Sponsored by School of Life Sciences.

We're on the Web!

See us at:

Geopig.asu.edu/DirtWaterCell.html

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