

at Joshua Tree National Park

74485 National Park Dr. Twentynine Palms, CA 92277  
Phone: 760-367-5539; e-mail: desertinstitute@joshuatree.org

## Desert Invertebrates, Diversity Great and Small A Macro Photography and Microscopy Primer

### Information

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Date/ Time: Saturday, October 16, 9 am – 4:30 pm  
Sunday, October 17, 9 am – 4 pm  
Meet at: [Oasis Visitor Center](#) (click on link for a map of the meeting site)  
74485 National Park Dr., Twentynine Palms, CA 92277  
Instructor: Paul DeLay, Ph.D., Zoology, UC Riverside

### Overview

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Participants will be introduced to the major groups of respectively macroscopic and microscopic invertebrates found in Southern California's deserts, where and when to find them, and how to observe and identify them with the aid of online tools after taking digital macro photographs in the field (in the case of insects and other animals visible to the naked eye), or with the aid of a compound microscope in the lab (for smaller animals). The first part, Saturday, will include an outline of basic techniques for approaching and photographing different macro subjects with a compact camera or an interchangeable lens/SLR camera. In the second part, Sunday, we will demonstrate simple techniques for isolating microscopic invertebrates from different materials, how to transfer them to microscope slides and how to operate a compound microscope to observe them.

### Itinerary

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Saturday, October 16, 9 am – 5 pm

*Oasis Visitor Center*

- Lecture
- Lunch Break, **bring your own food**
- Lab Session with microscopes

Sunday, October 17, 9 am – 4 pm

*Oasis Visitor Center*

- Lecture and Lab Session
- Snack break, **bring your own food**
- Lecture and Lab Session continued

### What to Bring to the Course

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#### *Optional Equipment*

### ***The 10 Essentials: Every day in the Desert***

- Day pack
- 4 quarts of water
- Hiking boots with traction soles
- Lunch and snacks
- Clothing layers
- Hat
- Sun glasses
- Sunscreen
- Notebook and pencil/pen
- Whistle

### **Fitness Requirements**

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Participants must be in good physical condition for courses/activities in a desert that may be hot, dry, windy, and sometimes surprisingly cold.

### **Hike Level**

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Easy to Moderate

### **Guidelines**

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- You are responsible for your safety.
- Park your car in designated areas only. Parking along the side of the road is dangerous to you and the environment.
- Rattlesnakes are present in the park. Avoid contact with wildlife. Put your hands and feet only where you can see.
- Stay with the group. If you get lost, stay put.
- Drink plenty of water. If you run out, notify the instructor or the Desert Institute Representative.
- Before leaving the class, check out with the Desert Institute Representative.

### **College Credit**

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If taking this course for 1.0 unit BIOLOGY X412.19 credit through the University of California, Riverside Extension there will be a half hour exam at the end and a formal grade of Satisfactory vs No credit (S/NC)

### **Instructor Biography**

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PAUL DELEY obtained his Ph.D. in Invertebrate Zoology at Ghent University, Belgium in 1994 and moved to Riverside in 2000 to joined the Department of Nematology at UCR as a faculty member. His research focuses on ecology, diversity and systematics of nematodes in arid ecosystems, using methods that combine light microscopy observations with DNA sequence analyses. His current

teaching duties include annual upper division undergraduate courses at UCR on the subjects of Invertebrate Zoology and Biology of Nematodes, and his past teaching also included subjects such as Soil Ecology, Arthropod Diversity, and Theoretical Systematics. He is an avid nature photographer with particular interest in macro photography as a tool for exploring biodiversity of Southern Californian deserts and ranges.

### **Suggested Readings**

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<http://www.desertusa.com/insects/world-of-insects.html>

<http://greenacresranch.wix.com/greenacresranch#!critters-insects/cxd4>

[http://school.discoveryeducation.com/schooladventures/soil/soil\\_safari.swf](http://school.discoveryeducation.com/schooladventures/soil/soil_safari.swf)

<http://openlearning.une.edu.au/LivingSoils/index.php?u=module01/index.htm>

<http://www.eyeofscience.de/en/zoology/>

More detailed or technical:

<http://bugguide.net/node/view/15740>

<http://www.nps.gov/moja/learn/science-newsletter.htm>

[http://extension.illinois.edu/soil/SoilBiology/soil\\_biology\\_primer.htm](http://extension.illinois.edu/soil/SoilBiology/soil_biology_primer.htm)

Books: Although no detailed field guides exist for invertebrates of Joshua Tree NP and the Mojave Desert, it will definitely help if you are already familiar with the major groups of insects and other invertebrates. Here are some examples of useful general guides for all of the US, or for less arid areas of California:

National Audubon Society Field Guide to North American Insects and Spiders (National Audubon Society Field Guides) National Wildlife Federation Field Guide to Insects and Spiders & Related Species of North America A Field Guide to Insects: America North of Mexico (Peterson Field Guides) Kaufman Field Guide to Insects of North America (Kaufman Field Guides)

California Insects (UC Press California Natural History Guides)

<http://nathistoc.bio.uci.edu/Arthropods.htm>

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\* The Desert Institute staff/instructors will attempt to accommodate participant's needs; however we reserve the right to deny a student participation in the course due to concerns regarding health and safety issues.