44th Annual
GEO DAZE
Department of Geosciences
University of Arizona
March 31st – April 2nd 2016
44th Annual

GEO DAZE

Department of Geosciences | University of Arizona
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GeoDaze 2016 was made possible by generous donations from

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Welcome

Welcome to the UA Department of Geoscience’s 44th annual GeoDaze! GeoDaze is a student-run research symposium that has become a hallmark at the University of Arizona for high-quality, research from undergraduate and graduate students. Each year, GeoDaze is made possible by generous donations from individuals and corporate sponsors. We thank you for your continued support. GeoDaze enables students to present their research to an enthusiastic audience of faculty, industry professionals, peers, and the general public. It not only disseminates cutting-edge research to the community, but also provides students with practical presentation and communication experience. GeoDaze collaborates with five other departments in the School of Earth and Environmental Sciences (SEES) to bring you EarthWeek, a celebration of scientific research to promote interdisciplinary discussion, collaboration, and exposure for all of the participating departments. A full schedule of EarthWeek events is included on page 6 of this program, and we encourage you to take advantage of all that EarthWeek has to offer.

This year, GeoDaze is proud to present 35 oral and 16 poster presentations from Geosciences graduate and undergraduate students. The diversity of these presentations spans both geographic regions and research interests and includes research in economic geology, tectonics and geochemistry, geophysics, paleoclimate, and climate dynamics. This year, GeoDaze is proud to host Dr. David Bercovici, the Frederick William Beinecke Professor of Geophysics at Yale University, as our keynote speaker. Dr. Bercovici’s research probes fundamental processes from the mantle to the crust that characterize our dynamic Earth. We invite you to attend Dr. Bercovici’s presentation entitled “The Origin of Plate Tectonics” at 2 PM on Friday, April 1st in the North Ballroom.

In accordance with tradition, many exciting “extracurricular” events will take place during GeoDaze. Our panel of faculty judges and sponsors will present awards for the best talks and posters in each session as well as the overall runner-up and best talk award at 3:00 PM on Friday. All attendees of GeoDaze are invited to attend the GeoDaze party and slide show, Friday evening. Eat, drink, and explore the beautiful desert landscape in the backyard of Dr. Jon and Pamela Pelletier. Make sure to save some energy for the GeoDaze field trip on Saturday. This year, Dr. Eric Seedorf will guide participants through Laramide deformation in the Tortilla Mountains. We would like to thank all of those who helped support and organize GeoDaze this year. Your tireless efforts ensure the continued success of GeoDaze!

Phillip McFarland and Andrea Stevens

Co-Chairs, 2016 GeoDaze Symposium
Committee

Co-chairs............................................................................................................Andrea Stevens and Phillip McFarland

Outreach.....................................................................................................................Dakota Isaacs

Audio/Video..............................................................................................................Melissa Harrington and Garrison Loope

Publications..............................................................................................................Lucia Profeta and Paul Goddard

Treasurer......................................................................................................................Daniel Portner

Slideshow....................................................................................................................Becki Beadling and Connor Nolan

Field Trip.....................................................................................................................Jack Gibbons and Carson Richardson

Refreshments..............................................................................................................Kathleen Compton and Derek Hoffman

Webmaster..................................................................................................................Jared Olyphant

Awards........................................................................................................................Kate Metcalf and Shana Wolff

Correspondence.........................................................................................................Jenny Dabbs and Katherine Guns

Registration................................................................................................................Kim Fendrich and Alexandra Macho

Fundraising................................................................................................................Shaunna Morrison and Simone Runyon

Department of Geosciences Information

Department of Geosciences, The University of Arizona

Gould-Simpson Building

1040 E. 4th Street        Phone: 520-621-6000
Tucson, AZ 85721          Fax: 520-621-2672
Event Locations and Schedule

View a complete version of the GeoDaze 2016 Program with Abstracts:

http://earth.geo.arizona.edu/16/schedule.html

GeoDaze Keynote Address

“The Origin of Plate Tectonics”

David Bercovici

Student Union Memorial Center North Ballroom, Friday, April 1st 2016, 2:00-3:00 pm

EarthWeek Plenary Speaker

“America’s Water Crisis and What To Do About It”

Robert Glennon

Student Union Memorial Center North Ballroom, Thursday, March 31st 2016, 5:00-6:00 pm
GeoDaze Thursday, March 31st, 2016

Oral Presentations (morning sessions)
Student Union Memorial Center NORTH BALLROOM

8:30-8:45 Welcome and Coffee

Economic Geology Part I
Session leader: Kojo Plange

8:45-9:00 STRUCTURAL RECONSTRUCTION OF THE TWIN BUTTES DEPOSIT, PIMA COUNTY, ARIZONA
Andrew S. Early

9:00-9:15 LARAMIDE DEFORMATION AND PORPHYRY-STYLE ALTERATION IN THE TORTILLA MOUNTAINS, SOUTHEASTERN ARIZONA
Daniel Favorito

9:15-9:30 DISTRIBUTION OF ARSENIC AND OTHER TRACE ELEMENTS IN IGNEOUS APATITE OF THE GREAT BASIN
Jennifer Dabbs

9:30-9:45 THALLIUM VARIATIONS IN ORE-FORMING SYSTEMS
Shelby Rader

9:45-10:00 BREAK

Economic Geology Part II
Session leader: Roy Greig

10:00-10:15 GEOLOGY AND HYDROTHERMAL ALTERATION OF THE EOCENE WARM SPRINGS PLUTON, EGAN RANGE, WHITE PINE COUNTY, NV
Alexandra Macho

10:15-10:30 EXTENDING EXTENSION INTO THE MAYSVILLE CANYON-HILLTOP-PARK SADDLE AREA, NORTHERN SHOSHONE RANGE, NEVADA
Carson Richardson

10:30-10:45 FORMATION CONDITIONS OF THE CASTING COPPER SKARN, NV, BASED ON SPECTROSCOPIC ANALYSIS AND ELASTIC MODELLING OF MINERAL INCLUSIONS
Drew W. Barkoff

10:45-11:00 THE ORIGIN OF HYDROTHERMAL APATITE AT THE HUMBOLDT COMPLEX, NV
Wyatt M Bain
11:00-11:15  BREAK

Climate

Session leader: Marie De los Santos

11:15-11:30  THE IMPACT OF OROGRAPHY ON THE EL NIÑO SOUTHERN OSCILLATION
Zachary Naiman

11:30-11:45  QUANTIFYING THE ROLE OF PACIFIC VARIABILITY IN RECENT GLOBAL
WARMING TRENDS
Cheryl Peyser

11:45-12:00  OCEAN HEAT TRANSPORT MECHANISMS AND CO₂–INDUCED OCEAN CLIMATE
CHANGE AROUND ANTARCTICA IN GFDL CM2.6 AND CM2.5
Paul Goddard

12:00-12:15  IMPACT OF THE MELTING OF THE GREENLAND ICE SHEET ON THE ATLANTIC
MERIDIONAL OVERTURNING CIRCULATION IN GFDL ESM2Mb
Rebecca Beadling

12:15-12:30  SPATIAL CONSISTENCY OF TEMPERATURE AND PRECIPITATION SCALING IN
CMIP5 MODELS
Luke A Parsons

12:30-1:30  LUNCH BREAK

Poster Presentations

1:30-3:00 Student Union Memorial Center SOUTH BALLROOM

Climate and Paleoclimate

G01: TOC ANALYSIS FOR HSPDP ON LAKE MAGADI SEDIMENTS AS A PALEOENVIRONMENTAL
INDICATOR FOR THE SOUTHERN KENYA RIFT
Julia Richter

G02: SOIL-STRATIGRAPHY AND LANDSCAPE EVOLUTION IN SUBARCTIC LOWLANDS: A
PALEOENVIRONMENTAL FRAMEWORK FOR HUMAN COLONIZATION OF EASTERN BERINGIA
Jennifer Kielhofer

G03: INTERCOMPARISON OF THE SOUTHERN OCEAN CIRCULATIONS IN IPCC-AR5 COUPLED
MODEL CONTROL SIMULATIONS
Jordan Abell

G04: A 500 YEAR MULTIPROXY RECONSTRUCTION OF AMAZONIAN HYDROLOGY
Nicollette Buckle
Geochemistry
G05: DIRECT U-PB DATING OF BIOGENIC APATITE FROM VERTEBRATE FOSSILS
Derek Hoffman

G06: QUANTIFYING CRUSTAL CONTAMINATION: RELATING SIO₂ AND εNd AS A PROXY FOR THE DEGREE OF CRUSTAL CONTAMINATION IN WESTERN NORTH AMERICA.
Max Larkin

G07: BADDELEYITE (ZrO₂) EXTRACTION FOR BASALT DATING
Felipe Moreno

G08: CENOZOIC MAGMATISM IN THE PAMIR: A GEOCHEMICAL INVESTIGATION OF SYN-COLLISIONAL INTRUSIVE ROCKS
Shane Scoggin

Tectonics
G09: TESTING MODELS FOR MIOCENE EXTENSION IN THE ALICHUR GNEISS DOME IN THE SOUTHERN PAMIR
Sharon Harris

G10: CLIMATIC AND TECTONIC CONTROL ON EROSION ACROSS THE ALPINE FAULT, SOUTH ISLAND, NEW ZEALAND
Kaitlynn Walker

G11: INVESTIGATION OF LARAMIDE PALEOELEVATION, WYOMING: PRELIMINARY LIPID BIOMARKER RESULTS FROM SYNOROGENIC DEPOSITS
Shana Wolff

Michelle Dafov

Planetary Geology
G13: LAVA FLOWS AND YARDANGS ON MARS
Jade Bowers

Mineralogy
G14: GREEN BERYL VS. EMERALD
Zakaria Jibrin

Geophysics
G15: IMPROVING CRUSTAL SCALE SEISMIC IMAGING OF THE SOUTHERN ANDES: APPLICATIONS OF A NEW DIX-TYPE RELATIONSHIP BETWEEN SURFACE-WAVE AND SHEAR-WAVE VELOCITIES
Ssu-Ting (Alice) Lai

G16: EVIDENCE FOR THE MECHANISM OF ABYSSAL HILL FORMATION IN BATHYMETRIC AND REFLECTION SEISMIC DATA
Clinton Koch
Oral Presentations (afternoon sessions)
Student Union Memorial Center NORTH BALLROOM

Paleoclimate

Session leader: Luke Parsons

3:15-3:30  THREE MILLENNIA OF DROUGHT IN THE SOUTHWEST: NEW RESULTS FROM TRACE ELEMENT ANALYSIS OF SPELEOTHEMS  
Melissa D. Harrington

3:30-3:45  EXPLORING SURFICIAL QUATERNARY SOIL CARBONATES NEAR BROWN MOUNTAIN, SOUTHERN ARIZONA AS A POTENTIAL PALEOCLIMATE RECORD  
Marie G. De los Santos

3:45-4:00  GALÁPAGOS CORALS REVEAL LATE TWENTIETH CENTURY WARMING IN THE EASTERN EQUATORIAL PACIFIC  
Gloria Jimenez

4:00-4:15  LINKING CLIMATE VARIABILITY AND CORAL HEALTH IN GREAT BARRIER REEF CORAL RECORDS  
Emma Reed

4:15-4:30  GLOBAL CLIMATE-DRIVEN VEGETATION TRANSFORMATION PAST AND FUTURE  
Connor Nolan

4:30-4:45  LINKING ATMOSPHERIC CIRCULATION & WESTERN STREAMFLOW WITH SEARCH ALGORITHMS & PROBABILISTIC MODELS  
Steven Brewster Malevich

5:00-6:00  EarthWeek Plenary Talk America’s Water Crisis and What To Do About It. Robert Glennon
GeoDaze Friday, April 1st, 2016

Oral Presentations
Student Union Memorial Center NORTH BALLROOM

Geophysics

Session leader: Nicollette Buckle

8:30-8:45  SLAB HOLE BENEATH THE EASTERN SIERRAS PAMPEANAS IMAGED BY NEW TELESEISMIC P-WAVE TOMOGRAPHY  
Daniel Evan Portner

8:45-9:00  RECEIVER FUNCTION ANALYSIS OF THE CENTRAL ANDES, SOUTHWESTERN BOLIVIA AND NORTHERN CHILE  
Dakota Isaacs

9:00-9:15  SHEAR WAVE VELOCITIES OF THE SOUTHERN PUNA PLATEAU: MAGMA ADDITION IN THE CONTINENTAL LITHOSPHERE  
Jonathan R. Delph

9:15-9:30  IS MAGMATIC ADDITION A SIGNIFICANT CRUSTAL GROWTH MECHANISM IN CORDILLERAN SYSTEMS?  
Kevin M. Ward

9:30-9:45  CRUSTAL STRUCTURE OF CENTRAL ANATOLIA FROM RECEIVER FUNCTION ANALYSIS  
Bizhan Abgarmi

9:45-10:00  DENSITY AND TOTAL VOLUME ESTIMATION OF MAGMATIC FEATURES USING 2D AND 3D INVERSION OF GRAVITY CONSTRAINED BY SEISMIC REFLECTION DATA ON THE GUINEA PLATEAU, WEST AFRICA  
Dominik A Kardell

10:00-10:15  TECTONICS IN THE MACQUARIE RIDGE COMPLEX  
Felipe Moreno

10:15-10:30  BREAK
**Geochemistry**

**Session leader: Kim Fendrich**

**10:30-10:45**  
MINERALOGY OF EOLIAN SANDS AT GALE CRATER, MARS  
Cherie Achilles

**10:45-11:00**  
EMPIRICAL RELATIONSHIPS BETWEEN WHOLE ROCK TRACE ELEMENT CONCENTRATION AND ZIRCON PARTITION COEFFICIENTS  
Jay Chapman

**11:00-11:15**  
THICKNESS OF THE EARTH’S EARLY CRUST AS REVEALED BY TRACE ELEMENTS IN JACK HILLS ZIRCONS  
Lucia Profeta

**11:15-11:30**  
THERMOCHRONOLOGY OF SECONDARY OXIDES NEAR MOAB, UTAH: RECORD OF PALEO-FLUID  
Victor H. Garcia

**11:30-11:45**  
EVIDENCE OF URINE IN A NEOLITHIC TELL IN RELATION TO ANIMAL DOMESTICATION  
Jordan Abell

**Tectonics**

**Session leader: Kendra Murray**

**11:45-12:00**  
A NEW DATABASE APPROACH TO ORGANIZE AND PLOT CHRONOMETRIC AGES  
Kathryn Metcalf

**12:00-12:15**  
TRACKING EXHUMATION OF THE HIMALAYAN FOLD-THRUST BELT FROM U-Pb MONAZITE AND ZIRCON THERMOCHRONOLOGY OF THE MIOCENE FORELAND BASIN, DUMRI FM., WESTERN NEPAL  
Simon Stickroth

**12:15-12:30**  
BRITISH COLUMBIA COAST MOUNTAINS METASEDIMENTARY ROCKS: AGE CONSTRAINTS AND PROVENANCE  
Michelle Dafov

**12:30-12:45**  
EXHUMATION PATTERNS ON THE SIERRA DE VALLE FÉRTIL, SIERRAS PAMPEANAS, ARGENTINA  
Gustavo Ortiz

**12:45-2:00**  
**LUNCH BREAK**

**2:00-3:00**  
**Keynote Address** The Origin of Plate Tectonics. David Bercovici

**3:00-4:00**  
GeoDaze 2016 Awards Ceremony

**6:00-11:00**  
GeoDaze Dinner Party & Slideshow Address and map on page 15
Maps and directions

Student Union Memorial Center (Black Circle)

Gould-Simpson Building (Black Rectangle)
MAP OF STUDENT UNION: LEVEL 3

ALL TALKS WILL BE LOCATED IN THE NORTH GRAND BALLROOM

ALL POSTERS WILL BE LOCATED IN THE SOUTH GRAND BALLROOM
**Directions**

1. Head north on Park Ave (or any other major N-S street in the area) until its junction with Grant Road.
2. Turn right (east) on Grant Road and follow it until its junction with E Tanque Verde Road.
3. Turn left onto E Tanque Verde Road and follow it to the east over the Tanque Verde Creek Wash until its junction with N Bear Canyon Road.
4. Turn left (north) onto N Bear Canyon Road and follow it north for approximately 1.7 miles until its junction with E Kayenta Drive.
5. Turn right (east) onto E Kayenta Drive.
6. Take the first left onto N Bidahochi Drive. Find a parking spot along N Bidahochi Drive.

**On-street parking is allowed in this neighborhood, but be courteous!**

**GeoDaze Party Friday 6:00 to 11:00**
4231 N Bidahochi Drive (Home of Jon Pelletier and family)