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**2002 GORDON RESEARCH CONFERENCE  
on ROCK DEFORMATION  
FINAL PROGRESS REPORT**

**DEPARTMENT OF ENERGY  
GRANT NO. DE-FG02-02ER15302**

The Gordon Research Conference (GRC) on ROCK DEFORMATION was held at Il Ciocco from 5/19/02 thru 5/24/02. The Conference was well-attended with 127 participants (attendees list attached). The attendees represented the spectrum of endeavor in this field coming from academia, industry, and government laboratories, both U.S. and foreign scientists, senior researchers, young investigators, and students.

In designing the formal speakers program, emphasis was placed on current unpublished research and discussion of the future target areas in this field. There was a conscious effort to stimulate lively discussion about the key issues in the field today. Time for formal presentations was limited in the interest of group discussions. In order that more scientists could communicate their most recent results, poster presentation time was scheduled. Attached is a copy of the formal schedule and speaker program and the poster program. In addition to these formal interactions, "free time" was scheduled to allow informal discussions. Such discussions are fostering new collaborations and joint efforts in the field.

I want to personally thank you for your support of this Conference. As you know, in the interest of promoting the presentation of unpublished and frontier-breaking research, Gordon Research Conferences does not permit publication of meeting proceedings. If you wish any further details, please feel free to contact me. Thank you.

Sincerely,



**ERNIE RUTTER**

**UNIVERSITY OF MANCHESTER**

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# Rock Deformation

## Deformation Mechanism and Mode of Failure Transitions in Rocks

May 19-24, 2002  
Il Ciocco  
Barga, Italy

**Ernie Rutter**, Chair  
**Andreas Kronenberg**, Vice-Chair

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Visit the [Conference Home Page](#) for more information.

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### SUNDAY

2:00 pm - 9:00 pm Arrival and check-in  
6:00 pm Dinner  
7:30 pm - 9:30 pm

### SETTING THE SCENE

Discussion Leader: **Joanne Fredrich** (Sandia National Laboratory, USA)  
7:30 pm - 8:30 pm **Teng Fong Wong** (SUNY, Stony Brook, USA)  
"Localized/distributed flow transitions - phenomenology and general overview"  
8:30 pm - 9:30 pm **Fred Chester** (Texas A & M University, USA)  
"The brittle/ductile transition as it is understood - is it a useful concept?"

### MONDAY

7:30 am - 8:30 am Breakfast

### DEFORMATION OF POROUS AND ANISOTROPIC MATERIALS

Discussion Leader: **Dave Olgaard** (Exxon, USA)  
9:00 am - 10:00 am **Felix Darve** (Nat. Polytechnic Inst. Grenoble, France)  
"Modes of failure in geomechanics: continuous and discrete analyses"  
10:00 am Coffee Break and Photograph  
10:30 am - 11:30 am **Attila Aydin** (Stanford, USA)  
"Volume changes during rock/soil failure and its role in determining failure mode"  
11:30 am - 12:30 pm **Cees Passchier** (Mainz, Germany)  
"Development of shear localization structures in anisotropic rocks"

12:30 pm Lunch

1:30 pm - 4:00 pm Free Time

4:00 pm - 5:30 pm Poster Session #1

### HIGH TEMPERATURE DUCTILITY AND LOCALIZATION

Discussion Leader: **Bill Durham** (Lawrence Livermore National Laboratory, USA)  
5:30 pm - 6:30 pm **Mervyn Paterson** (Australian National University)  
"Distributed vs localized deformation in the high temperature regime"  
6:30 pm - 7:30 pm **Steve Kirby** (US Geological Survey)  
"High pressure phase transformation and faulting"

8:00 pm Dinner

### TUESDAY

7:30 am - 8:30 am Breakfast

**9:00 am - 12:30 pm MICROSTRUCTURAL AND CHEMICAL PROCESSES**

Discussion Leader: **Holger Stuenitz** (Basel, Switzerland)

9:00 am - 10:00 am **Karsten Kunze** (ETH Zurich, Switzerland)  
"Role of microstructural evolution and CPO development"

10:00 am Coffee Break

10:30 am - 11:30 am **Hans de Bresser** (Utrecht, Holland)  
"Role of metamorphic reactions in shear localization"

11:30 am - 12:30 pm **Ben van der Pluijm** (Michigan, USA)  
"Focussing of geochemical processes into shear zones"

12:30 pm Lunch

1:30 pm - 5:30 pm Free Time

**5:30 pm - 7:30 pm FRACTURE AND FLOW MODELING**

Discussion Leader: **Bruce Hobbs** (CSIRO, Australia)

5:30 pm - 6:30 pm **John Rudnicki** (Northwestern, USA)  
"Numerical modeling and failure mode prediction in brittle rocks"

6:30 pm - 7:30 pm **Mark Jessell** (Monash, Australia)  
"Modeling flow and localization in rocks at high temperatures"

8:00 pm Dinner

**WEDNESDAY**

7:30 am - 8:30 am Breakfast

**9:00 am - 12:30 pm EVOLUTION OF PETROPHYSICAL PROPERTIES**

Discussion Leader: **Rob Knipe** (Leeds, UK)

9:00 am - 10:00 am **Ian Main** (Edinburgh, UK)  
"Evolution of petrophysical properties during deformation"

10:00 am Coffee Break

10:30 am - 11:30 am **Janos Urai** (Aachen, Germany)  
"Localized deformation zones as fluid flow conduits or seals"

11:30 am - 12:30 pm **Quentin Fisher** (Leeds, UK)  
"Variation of petrophysical processes during deformation: issues of importance for resource recovery"

12:30 pm Lunch

1:30 pm - 4:00 pm Free Time

4:00 pm - 5:30 pm Poster Session #2

**5:30 pm - 7:30 pm ROLE OF LOCALIZED DEFORMATION ZONES IN CRUSTAL EVOLUTION**

Discussion Leader: **Ron Bruhn** (Utah, USA)

5:30 pm - 6:30 pm **Rob Holdsworth** (Durham, UK)  
"Reactivation of pre-existing localized deformation zones"

6:30 pm - 7:30 pm **Joe White** (University of New Brunswick, Canada)  
"Shear zone strength, scaling and crust/lithosphere architecture"

8:00 pm Dinner

**THURSDAY**

7:30 am - 8:30 am Breakfast

**9:00 am - 12:30 pm FAULTING AND FRICTION**

Discussion Leader: **Steve Miller** (ETH Zurich)

9:00 am - 10:00 am **Art McGarr** (US Geological Survey)  
"Fresh rock fracture vs frictional sliding - what is the difference?"

10:00 am Coffee Break

10:30 am - 11:30 am **Dave Lockner** (US Geological Survey)

"What happens between peak rock strength and localization?"

11:30 am - 12:30 pm **John Townend** (Stanford, USA)  
"Does exceptionally weak frictional sliding occur?"

12:30 pm Lunch

1:30 pm - 4:45 pm Free Time

4:45 pm - 5:30 pm Business Meeting

5:30 pm - 7:30 pm **LOCALIZED VS DISTRIBUTED FLOW IN PARTIALLY MOLTEN ROCKS**  
Discussion Leader: **Mike Brown** (Maryland, USA)

5:30 pm - 6:30 pm **Ben Holtzman** (Minnesota, USA)  
"Localized vs distributed flow in partially molten upper mantle rocks"

6:30 pm - 7:30 pm **Ed Sawyer** (Quebec, Canada)  
"Flow and melt segregation in partially molten crustal rocks"

8:00 pm Dinner

**FRIDAY**

7:30 am - 8:30 am Breakfast

9:00 am Departure



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# ROCK DEFORMATION

Il Ciocco  
May 19-24, 2002

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**NOTE:** Receipt of Application does not guarantee acceptance to a Conference. Applications are reviewed by the Conference Chair. If the Chair approves your application, you become **Accepted** and you will be sent a personalized link to the GRC online registration site. When you complete the online registration, you become **Registered**.

Only those who have been **Accepted** or **Registered** will have their names listed below. Names of people who have only applied and have yet to be accepted will NOT appear.

Name	Organization	Participation	Status
YASER M ABDEL-AZIZ	ASSIUT UNIVERSITY	Attendee	Registered
EINAT AHARONOV	WEIZMANN INSTITUTE OF SCIENCE	Poster Presenter	Registered
ATILLA AYDIN	STANFORD UNIVERSITY	Speaker	Registered
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AUKE BARNHOORN	ETH - ZURICH	Poster Presenter	Registered
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