



A Summer School sponsored by NSF and ISeS  
August 5-12, 2006 - Colorado College

## Rheology Summer School Schedule ISeS 2006

### Saturday, August 5:

9 a.m. - 11 p.m. Participants arrive at Colorado College.

Transport from COS airport to Colorado College will be provided. Check-in is from noon to midnight, on the outdoor plaza at JLNight Apartments, where all participants will be accommodated during the School. For persons arriving by car or on a shuttle, directions and map are available at <http://acad.coloradocollege.edu/dept/gy/ises/ISEStravel.php>.

2:00 – 5:00 p.m. IT assistance for login procedures/wireless access to campus network; and software for the School. Campus recreation facilities are open, for early arrivals.

5:00 – 6:00 p.m. Instructors meeting in JLN Apt #101.

6:30 - 8:30 p.m. Mexican buffet and social hour.

### Sunday, August 6:

7:00 - 8:00 a.m. Buffet Breakfast in atrium of Tutt Science Center (adjacent to the classrooms)

8:00 – 8:15 a.m. Introduction to Summer School -- Chris Siddoway (Colorado College)

8:15 – 8:30 a.m. Assessment of the Summer School - Basil Tikoff (U Wisconsin)

8:30 - 12:15 p.m. **Introduction to rheology / Field rheology** -- Scott Johnson (Univ. of Maine)

10:00 – 10:15 a.m. Coffee break

12:30 – 1:30 p.m. Lunch at campus dining room, Rastall Hall in Worner Center.

1:45– 5:15 p.m.: Front Range brittle structures: field trip to Garden of the Gods, led by Christine Siddoway (Colorado College). Depart from Tutt Science parking lot, due west of the Science building.

5:30 - 7:00 p.m. Dinner in campus dining room, Rastall Hall in Worner Center. Presenters put up posters in Atrium of Tutt Science Center. Poster perusal.

7:00 – 9:30 p.m. **Numerical modeling of microstructural processes - the ELLE project**  
-- Scott Johnson (University of Maine)

**Monday, August 7:**

7:00-8:20 a.m. Breakfast in campus dining room, Rastall Hall in Worner Center.

8:30 -9:00 **Purpose and history of analogue models** -- Sandy Cruden (Univ. Toronto)

9.15 - 10.00 Activities 1 (in small groups. See topics, below.)

10:00–10:15 Coffee break

10.15 - 11.30 Lecture 2: Case studies highlighting brittle, ductile and combined brittle-ductile experiments, deformation visualization.

11.30 - 12.30 Activities 2 (in small groups). Topics:

**A. Granular material testing** using a shear wagon and force gauge. We will learn about stress - strain (time) curves, peak frictional strength, stable frictional strength and determination of Coulomb parameters.

**B. Viscous material testing.** We will measure the viscous properties of corn syrup using a rotary viscometer and construct a spreadsheet to determine its rheological properties.

**C. Benchtop Rayleigh-Taylor instability** (drip) experiment. We will set up a simple experiment using ductile and brittle materials. Internal viscous deformation will be monitored using digital time lapse photography. Dynamic topography will be measured by continuous laser ranging. Students will analyse data to determine finite growth rate of the instability and compare to Stokes equation and will generate a time series of model surface topography in both real and scaled equivalent units.

12:30 – 1:30 p.m. Lunch at campus dining room, Rastall Hall in Worner Center.

1:45 – 3:15 p.m. **Analog experiments with geological materials** -- Steve Quane (Colorado College and University of British Columbia)

3:30 – 5:15 p.m. **Student poster session**

5:30 – 6:30 p.m. Dinner in campus dining room, Rastall Hall in Worner Center.

Evening. **No Activity planned.**

**Tuesday, August 8:** Jan Tullis (Brown University) and Holger Stunitz (University of Basel)

7:00 - 8:20 a.m. Breakfast in campus dining room, Rastall Hall in Worner Center.

8:30 - 12:30 p.m. **Dislocation creep processes & microstructures: lecture and thin section lab**

10:00 – 10:15 a.m. Coffee break

12:30 – 1:20 p.m. Lunch at campus dining room, Rastall Hall in Worner Center.

1:30 - 5:00 p.m. **Using flow law and piezometer from experiments to nature; lecture and lab**

3:15 – 3:30 p.m. Coffee break

5:30 – 6:30 p.m. Dinner in campus dining room, Rastall Hall in Worner Center.

7:30 – 8:30 p.m. **Conversation session on Professional Transitions** (e.g. from graduate student to professional life) – to begin with remarks David Fountain, NSF Program manager for Earth Sciences: Tectonics.

**Wednesday, August 9:**

**6:15 a.m. Meeting time for All-day field trip** to Homestake shear zone, to be led by Colin Shaw (Montana State University). A breakfast stop will be made at the first geological stop, ~ 1 hour in to the trip. Packed lunches will be provided, and a dinner stop will be made during the return journey. Bring: sun screen, water bottles (2 liters minimum), sturdy footwear for rough terrain, and lightweight raingear; in addition to compass, hand lens, and field book, ±rock hammer if feasible. (Airlines will not allow a sledge hammer in handcarry luggage! Some number of CC sledges will be on hand for general use.)

10:00 p.m. Estimated return time.

**Thursday, August 10:**

7:00 – 8:30 a.m. Breakfast in campus dining room, Rastall Hall in Worner Center.

9:00 - 12:30 p.m. **Numerical models of deformation: Implications of rheology** --  
Luc Lavier (Texas Institute of Geophysics)

10:00 – 10:15 a.m. Coffee break

12:30 – 1:20 p.m. Lunch at campus dining room, Rastall Hall in Worner Center.

1:30 – 3:15 p.m. **Computational Infrastructure for Geodynamics [CIG] and numerical modeling** - --  
Walter Landry (CIG)

3:15 – 3:30 p.m. Coffee break

3:30 – 5:15 p.m. **Poster session and/or continued work with CIG** (individual choice)

5:30 - 6:30 p.m. Dinner in campus dining room, Rastall Hall in Worner Center.

7:30 – 9:00 p.m. Happy hour and conversation groups on Professional transitions (diverse topics: student input requested). Possibilities are job interviews, proposal writing, defining a research program that you can intelligently discuss with prospective employers; setting up a postdoc; civic involvement; gender issues; course design, preparation and evaluations; preparing an interview talk; discussing start-up funds, etc.

**Friday, August 11:** Jan Tullis (Brown University) and Holger Stunitz (University of Basel)

7:00 - 8:20 a.m. Breakfast in campus dining room, Rastall Hall in Worner Center.

8:30 - 12:30 p.m. **Cataclastic flow, grain size sensitive creep and deformation of polyphase rocks: lecture and lab**

10:00 – 10:15 a.m. Coffee break

12:30 – 1:20 p.m. Lunch at campus dining room, Rastall Hall in Worner Center.

1:30 - 4:30 p.m. **Overview of lithospheric rheology; lab review & participants' thin sections**

3:15 – 3:30 p.m. Coffee break

6:30 - 10:00 p.m. Celebratory banquet and BBQ, Morreale Carriage House patio

Transportation to Airport will be coordinated for participants who have early departures on this day.

**Saturday, August 12:**

7:00-8:20 a.m. Breakfast in campus dining room, Rastall Hall in Worner Center.

Wrap-up session and final assessment tasks.

Airport transportation will be coordinated for departures from COS and DIA.