

**Workshop on Numerical Modeling of Lithospheric
and Mantle Dynamics**

Third Circular

May 1990

Dear colleague,

This is the third announcement of a workshop on numerical modeling of lithospheric and mantle dynamics to be held Aug. 6 - 11, 1991 (just before the IUGG assembly in Vienna) in Weilburg/Lahn (Germany). Since you indicated your interest of attending the workshop, we ask that at this time you fill in the registration form. Please return it **before June 16, 1991** (if possible).

The idea. The idea of this workshop is to discuss methods, assumptions, approximations and boundary conditions pertinent to modeling of mantle convection and lithospheric dynamics. Rather than to only present final results, contributions which emphasize problems in modeling and techniques are welcome. Not everyone is expected to present a talk. Ample room for discussions will be reserved, so the participants should be prepared to take up topics of their interest (so bring along some viewgraphs for ad hoc presentations). Participants are also encouraged to bring posters. The mantle convection and lithospheric dynamics session will be organized in a slightly different way, see below. All participants are encouraged to stay for the whole workshop.

The time schedule. The time schedule of the workshop is

Aug., 5:	Arrival
Aug., 6 - 8:	Mantle convection
Aug., 8 - 10:	Lithospheric dynamics
Aug., 11:	Final discussion and departure

The site. The workshop will be held at

Hessisches Institut für Lehrerfortbildung
Frankfurterstr. 20-22
6290 Weilburg/Lahn
Tel. ..49 - 6471 - 39013

Accommodation will be at the same site as the workshop. The price for fullboard is about 50.-DM per day. Some funds are available for partial support of travel expenses. Please indicate need of support for Room and Board on registration.

Access to the workshop. Weilburg can be accessed by train. The nearest airport is Frankfurt Rhein-Main-Airport. We will provide detailed information later. Some shuttle service might be offered.

Since some participants might plan to go to Vienna directly after the workshop, we might be able to organize a travel group

Preliminary Program

Monday, Aug., 5

All day Arrival in Weilburg
19.00 Dinner

Tuesday, Aug., 6

9.00 Opening of the workshop

 Towards numerical modeling of mantle convection
 (How realistic are mantle convection models at present? Rheological aspects, influence of chemical and phase boundaries, boundary conditions, variable material properties, etc.)

14.00 Timedependent convection and the transition to chaos

20.30 General discussion, ad hoc presentations, "beer session"

Wednesday, Aug., 7

9.00 Numerical Results and Methods in 3-D convection
 (The different approaches; Verification of stability regimes; Time-dependence; When are 2-D-calculations sufficient?; etc.)

14.00 3-D convection benchmark
 (Discussion of the firsts results, Definition of final parameters)

 Modeling the lithosphere in mantle convection

20.30 General discussion, ad hoc presentations, "beer session"

Thursday, Aug., 8

9.00 The interaction between thermal and chemical convection
 (Discussion and presentations of the chemical convection exercise; Comparison of the different methods; etc.)

14.00 Sightseeing/hiking tour

Friday, Aug., 9

9.00 Interaction between asthenospheric and lithospheric processes
 (How to couple Asthenospheric and lithospheric dynamics; Mechanical and Numerical issues; Scale lengths in time and space)

- 14.00 Thermo-Mechanical modeling of lithospheric dynamics
(Boundary conditions, simulation of realistic rheologies; Lagrange versus Euler- approaches; the incompressibility problem in some FE-approaches; etc.)
- 20.30 General discussion, ad hoc presentations, "beer session"

Saturday, Aug., 10

- 9.00 Scale effects and Modeling
(Localization, bifurcation, instability, shear zones, fracture, boundary layers, phase change; Heterogeneities in the lithosphere, Constitutive equations; etc.)
- 14.00 Large scale stress modeling
(boundary conditions - discretization; sensibility on the physical assumptions; Results: signification and constraining data)
- 20.30 or Sunday, Aug. 11
- 9.00 Final discussion: Present understanding of the style of mantle convection and plate dynamics
- 11.00 Departure

**Workshop on Numerical Modeling of Lithospheric
and Mantle Dynamics**

Last info for participants

July 1st 1990

Dear participant,

This last circular will give you some travel information of how to access Weilburg.

The site. The workshop will be held at

Hessisches Institut für Lehrerfortbildung
Frankfurterstr. 20-22
6290 Weilburg/Lahn
Tel. ..49 - 6471 - 328-0
 or 328-33
 or 328-14

Accommodation will be at the same site as the workshop (except for those coming with spouse or family) . Room/board and conference fees will be covered. Travel expences can be covered only partly.

Access by car. Autobahn and highways are indicated on the enclosed map.

Access by train. With Intercity trains you will arrive in Gießen or Koblenz. They go approximately every hour. From Gießen there is a direct train to Weilburg via Wetzlar, leaving approximately every hour between 05.53 and 21.15 hours (Mondays to Saturdays, on Sunday less frequently). This ride takes about 30-40 minutes.

From Koblenz a train leaves approximately every 1 -1.5 hours between 04.38 and 20.53 hours (Mondays to Saturdays). It takes less than two hours to Weilburg. Sometimes one has to change train in Limburg.

From the railway station in Weilburg take a Taxi or walk (see map) .

Access by plane. For those arriving at Frankfurt Rhein-Main-Airport, we will provide a bus transfer to Weilburg (see below). Alternatively you might take the train (Intercity) to Gießen where you have to change train (see above). A Taxi from Frankfurt to Weilburg will cost about 140.-DM.

Transfer Frankfurt to Weilburg. We will provide a bus transfer from Frankfurt to Weilburg on Monday, Aug. 5 (and back to Frankfurt on Sunday, Aug 11). The bus will leave Frankfurt Central station ("Hauptbahnhof Südseite") at approx. 18.00 hours. It will have a sign like "Workshop Weilburg". Departure from Frank-

furt airport will be at approx. 19.00 hours. Please come to the "meeting point" (in the arriving hall B), you will be picked up there. If your plane arrives late, please check if still someone is waiting for you there before continuing on your own.

If you are interested in the transfer, please give one of us (preferably Schmeling or Christensen) the full information about your flight (time of arrival, flight no.) by Fax, e-mail, or Telex.

The (US-) participants arriving on Monday morning are asked to do some sight-seeing in Frankfurt, if they want to use the bus transfer in the evening. There is a local train (S-Bahn) from the airport to the city.

Finally we want to remind the convection-participants of bringing some results about the 3D-benchmark or the thermo-chemical exercise. There is still time to do some calculations!

We are looking forward seeing you in Weilburg,

Local organizers:

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