

Please send this report to the Secretary of the European Mechanics Council, Professor Bengt Lundberg, School of Engineering, Uppsala University, Box 534, S-751 21 Uppsala, Sweden, within one month after the Colloquium.

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02 NOV 1993

General

Euromech Colloquium No: 303

Title: Influence of microstructure on the constitutive equations in solids

Co-Chairmen: Professor K.P.Herrmann,
Professor O.B.NaimarkPlace and country: On the board the ship from Moscow to Perm,
Russia

Dates: 11-19 May, 1993

Finance

The conference fee 450\$ included full accomodation on board the ship, meals, excursion program in the famous russian towns, cultural program on board the ship, conference dinner.

Funding:

Accomodation (type and cost):

Meals:

Participation

Total number of participants: 43

Distribution of participants by country:

| Code | Country | Number | Code | Country | Number |
|------|----------------|--------|------|-------------|--------|
| A | Austria | _____ | IRL | Ireland | _____ |
| B | Belgium | _____ | LT | Larvia | _____ |
| BG | Bulgaria | _____ | LV | Lithuania | _____ |
| CH | Switzerland | _____ | N | Norway | _____ |
| CS | Czechoslovakia | _____ | NL | Netherlands | _____ |
| D | Germany | 2 | P | Portugal | _____ |
| DK | Denmark | _____ | PL | Poland | _____ |
| E | Spain | _____ | R | Rumania | _____ |
| EE | Estonia | _____ | S | Sweden | _____ |
| F | France | 7 | SF | Finland | _____ |
| GB | Great Britain | _____ | YU | Yugoslavia | _____ |
| GR | Greece | _____ | CIS | CIS | 31 |
| H | Hungary | _____ | - | Others | 2 |
| I | Italy | _____ | | | |

Is there need of another colloquium on the same subject? Which year? Non-linear phenomena
under plastic instability and failure in solids, 1995

Scientific Report

Euromech Colloquium "Influence of microstructure on the constitutive equations in solids" was held in Russia on board the ship from Perm to Moscow down on the great Russian rivers: the Kama and Volga. This Colloquium was devoted to the application of the methods of non-linear physics and mechanics in the problems of failure, phase transformation and plasticity of materials with structure.

The following problems were discussed in the framework of the Colloquium scientific program:

- The reflection of structural changes in the constitutive equations;
- Collective effects, self-organization and dissipative structures in ensembles of defects in the processes of deformation and failure of solids;
- Non-linear effects in solids: localization of plastic deformation and damage, regularities of transition to the macrocracks nucleation, self-similarity and topological aspects of failure;
- Application to the fracture problems of ceramics, composites, nano-crystals materials, anomalies of plasticity, fracture and deformation under shock wave loads.

The scientific talks were delivered during the five days were accompanied by regular discussions in the evening and round table discussions as well.

The basic topics of discussions and round table discussions were the following:

- Theoretical aspects on the non-linear evolution of defects in the problem of quasi-brittle fracture of the high-strength materials;
- Thermodynamics and mechanical behaviour of solids under martensitic transformation and shape memory effect;
- Non-linear phenomena in ensembles of defects and effects of the plastic localization and the plastic instabilities.

The participants of the Colloquium suggested Euromech scientific meeting on non-linear problems in mechanics and physics of the medium with microstructure should continue in future.

Co-Chairman
of the Colloquium
professor



O. B. Naimark

Please use additional pages if needed and sign at the end.