

Please send this report to the Secretary of the European Mechanics Council, Professor Bengt Lundberg, Dept of Mechanical Engineering, Luleå University of Technology, S-951 87 Luleå, Sweden, within one month after the Colloquium.

### General

Euromech Colloquium No: 304

Title: Mechanics of Microstructured Materials

Co-Chairmen: Dr W.J. Stronge

Place and country: Cambridge, U.K.

Dates: 28-30 June 1993

### Finance

The conference fee £180 included 3 days' accommodation and meals, charge for conference room, postage, xeroxing, etc.

Funding: Applications for conference support were denied by The Royal Society and the U.S. Army Research Office

Accommodation (type and cost): College rooms

Meals:

### Participation

Total number of participants: 42

Distribution of participants by country:

Code	Country	Number
A	Austria	2
B	Belgium	
G	Bulgaria	1
CH	Switzerland	1
CS	Czechoslovakia	
D	Germany	3
DK	Denmark	
E	Spain	
EE	Estonia	
F	France	3
GB	Great Britain	10
GR	Greece	
H	Hungary	
I	Italy	5

Code	Country	Number
IRL	Ireland	1
LT	Latvia	
LV	Lithuania	
N	Norway	
NL	Netherlands	1
P	Portugal	6
PL	Poland	1
R	Rumania	
S	Sweden	2
SF	Finland	
YU	Yugoslavia	
CIS	CIS	1
-	Others	5

Is there need of another colloquium on the same subject? Which year? Yes, 1996

## Scientific Report

31 papers were presented that roughly divided into three subjects: constitutive modelling of microstructured materials; mechanical properties of natural cellular materials such as wood and sponges; and mechanics of particulate composite materials. The papers were mostly of high quality. They will be published independently by the authors.

A word of caution to organisers of future colloquia. There were about 7 papers accepted from authors in the former Soviet Union. After receiving their notice of acceptance, all of these authors expected the organiser to obtain grants to support their participation. The only Soviets who actually attended were those for whom I had obtained support.



W.J. Stronge  
University of Cambridge

# EUROMECH 304

## MECHANICS OF MICROSTRUCTURED MATERIALS

### TECHNICAL PROGRAM

Lecture Room A, Department of Applied Mathematics, Mill Lane

#### Monday 28 June

9:00 Opening Dr W J Stronge

*Chairman:* Dr J Woodhouse

9:15- 9:45 Dr K E Evans

Microstructures that exhibit a negative Poisson's ratio

9:45-10:15 Prof D Weaire

Computer simulation of foams

10:15-10:45 Prof A M Segadães

Efficient bimodal particle packing and its bearing on the processing of porous ceramics from coagulated slurries

#### *Coffee*

11:10-11:40 Prof S Kyriakides

On the initiation and propagation of localized collapse in transversely loaded honeycombs

11:40-12:10 Dr S Appleby

Effective medium methods applied to porous solids

12:10-12:40 Dr P Giovine

Reticular systems for diatomic continua and porous solids

#### *Lunch*

*Chairman:* Prof G Herrmann

2:00-2:30 Prof G Capriz

Foundations of dynamics of continua with microstructure

2:30-3:00 Dr T Barta

A contribution to the intrinsic formulation of Cosserat-continuum mechanics

3:00-3:30 Prof A N Guz

Continuum theory of fracture of composite materials at bearing strain in end faces in compression

#### *Tea*

4:00-4:30 Dr N A Fleck

Strain gradient plasticity: theory and experiments

4:30-5:00 Dr C Poirier

Strain localization in Schneebeli models: effects of disorder

#### Tuesday 29 June

*Chairman:* Prof D Weaire

9:00- 9:30 Dr W J Stronge

Dynamic crushing of ductile cellular solids

9:30-10:00 Mr T Siegmund

Properties of polycrystalline two-phase materials

10:00-10:30 Dr E Weissenbek

Micromechanical modelling of plasticity effects in particle reinforced MMC's

#### *Coffee*

11:00-11:30 Prof G Herrmann

Modelling of damage in elastic solids based on thermodynamics

11:30-12:00 Dr J Grabacki

Structured materials as material structure with internal variable

12:00-12:30 Prof X Markenscoff

Stress amplification in thin ligaments in two and three dimensions

#### *Lunch*



## EUROMECH 304

### Tuesday 29 June (continued)

*Chairman:* Prof S R Reid

2:00-2:30	Dr R V Craster	Fracture in porous elastic solids
2:30-3:00	Dr T Sadowski	Effective strain-related damage concept in application to brittle materials
3:00-3:30	Mr Y Godin	Interaction of inclusions in an infinite elastic medium

*Tea*

4:00-4:30	Prof P Gudmundson	A model for stress-strain evolution in micro cracking composite laminates
4:30-5:00	Dr T Lewinski	Overall behaviour of plates and composites with periodic structure
5:00-5:30	Prof P Olsson	Thin interface layers in composites: effective modelling for wave propagation

### Wednesday 30 June

*Chairman:* Prof A N Guz

9:00- 9:30	Prof S R Reid	Indentation of wood parallel to the grain
9:30-10:00	Dr J F V Vincent	Plants as cellular materials
10:00-10:30	Prof L J Gibson	Biomimicking of plant stems: elastic buckling of cylindrical shells with foam cores

*Coffee*

11:00-11:30	Prof M A Fortes	Modelling of foam compression at constant rate
11:30-12:00	Dr V Bucur	Viscoelastic behaviour of solid wood by acoustic techniques
12:00-12:30	Dr C Barlow	Mechanical properties and microstructure of bent spruce

*Lunch*

2:00 - 2:30	Dr A G Kolpakov	Design of laminated composites possessing specified homogenized characteristics
2:30 - 3:00	Prof K Z Markov	On a microstructural model of brittle damage in solids