

# EUROMECH

EUROPEAN MECHANICS SOCIETY

# Final Report

Please send this report to the Secretary General of EUROMECH, within one month after the Colloquium.

EUROMECH Colloquium No: 425

Title: Nonlinear Dynamics, Control and Condition Monitoring

Dates and location: 20 - 24 August 2001, Aberdeen, UK

Chairperson: Dr. Marian Wiercigroch, Aberdeen University

Co-Chairperson: Prof. Albert A Rodger (Aberdeen University) and Prof. Edwin Kreuzer (TU Hamburg-Harburg)

Is there need of another Colloquium on the same or a related subject? Which year? No.

Full registration fee: £180

What other funding was obtained? £4500 from the London Mathematical Society to support researchers from the former Soviet Union and PhD students

What were the participants offered?

Book of abstracts, refreshments, lunches, welcome reception.

Number of members of EUROMECH (reduced registration fee): 14

Number of non-members of EUROMECH (full registration fee):

Number of participants from each country:

Austria	<u>1</u>	Germany	<u>2</u>	Romania	<u>    </u>
Belgium	<u>    </u>	Great Britain	<u>21</u>	Russia	<u>6</u>
Byelorussia	<u>    </u>	Greece	<u>1</u>	Slovakia	<u>    </u>
Bosnia	<u>    </u>	Hungary	<u>3</u>	Slovenia	<u>3</u>
Bulgaria	<u>    </u>	Ireland	<u>    </u>	Spain	<u>2</u>
Croatia	<u>    </u>	Italy	<u>6</u>	Sweden	<u>2</u>
Czech Republic	<u>4</u>	Latvia	<u>    </u>	Switzerland	<u>    </u>
Denmark	<u>    </u>	Lithuania	<u>    </u>	Ukraine	<u>    </u>
Estonia	<u>    </u>	Netherlands	<u>2</u>	Yugoslavia	<u>    </u>
Finland	<u>2</u>	Norway	<u>    </u>	Turkey	<u>    </u>
France	<u>1</u>	Poland	<u>1</u>	Others	<u>10</u>
Georgia	<u>    </u>	Portugal	<u>1</u>	Total	<u>68</u>

## Scientific Report

EUROMECH 425 was held between 20 and 24 August 2001 at the Department of Engineering, Aberdeen University (UK). The meeting was devoted to recent advances in nonlinear dynamics, control and condition monitoring of engineering systems and structures. It is seen across the European mechanics spectrum that more and more emphasis is laid on the practical applications of theory into interdisciplinary research. In addition to Euromech the conference was sponsored by the London Mathematical Society and the University of Aberdeen.

There were 69 participants from 20 different countries and four continents. Members of the Local Organising Committee together with PhD students boosted the total number to 79. There were 68 presentations delivered in six mini-symposia, which together with their organisers are listed below:

- (i) new methods and techniques of nonlinear dynamics (Celso Grebogi),
- (ii) nonlinear dynamics of mechanical systems (Marian Wiercigroch),
- (iii) nonlinear dynamics of civil engineering systems (Giuseppe Rega),
- (iv) nonlinear dynamics of electrical systems (Yoshishuke Ueda),
- (v) control of dynamical systems (Matthew P Cartmell),
- (vi) condition monitoring of engineering systems (Albert A Rodger).

The Colloquium was opened with a lecture given by Celso Grebogi (University of San Paulo) on 'Shadowing and the validity of dynamical models'. A pioneer of chaotic dynamics in electrical systems, Yoshishuke Ueda, gave an interesting historical account on his ground breaking research at Kyoto University. These have attracted vigorous discussions and proved to be effective stimuli throughout the meeting which has in addition eleven plenary lectures and 47 invited presentations. The largest mini-symposium attracting twenty-three presentations was devoted to nonlinear dynamics of mechanical systems. A more detailed information on the programme and other aspects of the conference can be found at [www.eng.abdn.ac.uk/~eng373/Euromech/index.htm](http://www.eng.abdn.ac.uk/~eng373/Euromech/index.htm). In addition to the lectures and discussions, there were two experimental demonstrations on 'dynamics and fatigue' and 'chaotic dynamics of a rotor system with a clearance' in the Dynamics Research Laboratory at the University of Aberdeen.

We believe that by a careful planning and a targeted invitation strategy, a right balance between various subjects, nationalities, and ages of participants was struck, and this resulted in a very successful meeting. During the conference numerous fruitful discussions were conducted, new friendships and collaborative links were born, and participants had a fair chance to sample Scottish hospitality and culture. As a consequence Euromech has gained fifteen new members, who has decided to joint the European Mechanics Society during Euromech Colloquium 425.

19/11/01 