

PROCEEDINGS OF THE 4th INTERNATIONAL CONFERENCE ON NONLINEAR MECHANICS

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Editor-in-Chief: CHIEN Wei-zang

Vice-Chief Editors: CHENG Chang-jun, DAI Shi-qiang, GUO Xing-ming, DONG Li-yun



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PROCEEDINGS OF THE 4TH
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Prof. CHIEN Wei-zang

FOURTH INTERNATIONAL CONFERENCE ON NONLINEAR MECHANICS

(ICNM-IV)

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Shanghai, China***

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PREFACE

The Fourth International Conference on Nonlinear Mechanics (ICNM-IV) is about to be convened. Presented to readers is a thick volume of Proceedings, collecting 253 papers in all. We have enough reason to feel gratified with the number, which indicates that the Conference has continuously received active support and extensive attention from the academic circles. It is expected that the number of participants in this Meeting will exceed that of the previous three ones. It shows that the subject of nonlinear mechanics has prosperous vitality and has won remarkable progress in recent years. The growing attendance is also a display of the unfailing vigor of our series of conferences.

The vitality and attraction of a research field originate from its social demand. As I pointed out twenty years ago, with the rapid development of economy, science and technology, people have been facing with the challenge of many nonlinear problems. This situation provides ample opportunities for nonlinear mechanics. The flood of contributions to the Conference is a clear proof. I am sincerely pleased during my perusing of the contributed papers. The scope and depth of related researches are fairly beyond my expectation. Various new topics, such as the nonlinear coupling of multiple fields, multi-scale effects, MEMS and micro-fluid, smart materials, chaotic control, inverse problems, wavelet analysis, etc, have gained a new insight into the subject. And the papers also involve the wide applications of nonlinear mechanics, for example, the development of new advanced materials, damage and fatigue analysis, traffic flow research, complex structures and machinery, and so on. To my more delight, some excellent papers concerning experimental mechanics appear in the Proceedings.

It is very honored that this conference will be held jointly with the IUTAM Symposium on Duality-Complementarity-Symmetry in nonlinear mechanics initiated by the International Union of Theoretical and Applied Mechanics, which will undoubtedly make the Conference more colorful. I enjoyed pleasant cooperation with the co-chairman, Prof. R. W. Ogden. We are deeply convinced that overall similarity in topics and slightly difference in visual angles of the two Conferences would promote the academic exchange among all the participants, beneficial to both sides. (The Proceedings of the IUTAM Symposium will be published in another volume later).

Another feature of the conference is the organization of three mini-symposia concerning piezoelectric materials, nonlinear waves in solids and vortex dynamics. Their organizers have made elaborate preparation for them. These mini-symposia are anticipated to be a great success.

As in preparing previous Conferences, the preparatory work of the ICNM-IV has proceeded under the thoughtful and fruitful guidance and help of the members of the Steering Committee. And the members of the Scientific Committee meticulously selected papers and compiled the Proceedings. I would like to express my heartfelt gratitude to them. My sincere thanks are also due to the IUTAM Symposium Committee, the National Natural Science Foundation of China, the National Natural Science Foundation of USA, the K. C. Wong Foundation and the Science and Technology Commission of Shanghai Municipality, who provided generous financial support to the Conference. Finally, I would like to thank the members of Shanghai University Press, who completed the high-quality Proceedings in this hot season.

Chien Wei-zang

July, 2002, Shanghai, China

FOREWORD

The First International Conference on Nonlinear Mechanics was held in Shanghai in October, 1985 and then the Second and Third Conferences were convened respectively in Beijing in August, 1993 and in Shanghai in August, 1998. The Fourth International Conference on Nonlinear Mechanics is going to be held in Shanghai in August, 2002. It is not so often that a series of international conferences have been convening successfully in one country with increasing frequencies and increasing number of participants.

The influence and leading role of Prof. Chien Wei-zang have played a crucial part in the success of the series of conferences. Prof. Chien published his famous papers on the intrinsic theory of plates and shells at his age of thirty and completed the work on the plate-shell theory based on non-Kirchhoff assumptions when he was near 90 years old. He has been plowing and weeding in the field of nonlinear mechanics for almost 60 years. It is of greater importance that he cultivated and trained a large amount of younger talents in the area of mechanics, founded the related institutions, advocated various activities of academic exchanges and promoted the development of nonlinear mechanics in China and in the world.

Prof. Chien will have his 90th birthday this year. The convening of the ICNM-IV gives us an opportunity of celebrating his academic achievements and expressing our reverence to him, together with our colleagues and friends all over the world. We feel much honored to be part of this grand occasion.

Zhou Zhe-wei

Chairman of the Organizing
Committee of ICNM-IV
July, 2002, in Shanghai

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