

**XXII YUGOSLAV CONGRESS OF THEORETICAL AND
APPLIED MECHANICS,
Vrnjačka Banja, June 2-7, 1997.**

The XXII YUGOSLAV CONGRESS OF THEORETICAL AND APPLIED MECHANICS (XXIIth YUCTAM Vrnjačka Banja 97) was held from June 2 to 7, 1997. at Vrnjačka Banja Congress Center "Zvezda" , Yugoslavia, under the auspices of Yugoslav Society of Mechanics. XXIIth YUCTAM Vrnjačka Banja 97 is organized by Mathematical Institute SANU, Belgrade and Faculty of Mechanical Engineering University of Belgrade. Sponsors were: Ministry of Science and Technology of the Republic of Serbia, Ministry of Science and Technology of the Republic of Yugoslavia, Ministry of Science and Technology of the Republic of Crna Gora, Ministry of Education of the Republic of Serbia, NITEX NIŠ, DIN NIŠ and Faculty of Mechanical Engineering University of Niš.

Chairman of the Scientific Committee was Academician Nikola HAJDIN, SANU.

The Opening Ceremony was followed by the Opening Plenary Lecture

"State and Future of Mechanics in Engineering Science and in Applications"

by Academician Nikola HAJDIN.

Opening Ceremony includes Address by Academician Vladimir MATROSOV, member of Russian Academy of Sciences and President of Academy of Nonlinear Sciences, Professor dr Anthony KOUNADIS, member of European Academy of Sciences, Greece NTUA, Professor Guseppe REGA, Universita di Roma " La Sapienza", Italy, Prof. dr ing sci ANGEL IVANOV BALTOV, Scientific secretary of Bulgarian Academy of Sciences, and Prof. dr Iliya BLEKHMAN, member of Academy of Engineering Sciences Sankt Petersburg, to participants of XXII YUCTAM 97.

The program of the Congress contained following sections:

A-General Mechanics;

B-Fluid Mechanics;

C-Mechanics of Solid Deformable Body;

D-Interdisciplinar and Multidisciplinary Problems.

Lecturers in the sections "***Mechanics of Deformable Body***" are dedicated to the memory of Jakov Hltchiev (1886-1963), Professor of Theory of Elasticity.

In the scope of XXII Yugoslav Congress on the Theoretical and Applied Mechanics MINISYMPOSIUMS were organized on the topics:

MA. "***Mathematical Methods in Mechanics***": Chairmans: Prof. dr Veljko VUJIČIĆ, Member of ANN., and Prof. dr Zoran MARKOVIĆ

MN. "***Nonlinearity and Chaos in EngineeringDynamics***"- Chairman: Prof. dr Katica (Stevanović) HEDRIH

MF. *Recent Advances in Fracture and Damage Mechanics*, International Minisymposium Chairmans: Prof. dr Stojan SEDMAK and Prof. dr Dragoslav ŠUMARAC

MC. *Computing Mechanics*. Chairmans: Academician Đorđe ZLOKOVIĆ, Prof. dr Mladen BERKOVIĆ, and Prof. dr Miodrag SEKULOVIĆ and
and Round Table - *History of Mechanics in Yugoslavia* - Chairmans: Prof. dr Vlatko BRČIĆ, Prof. dr Nataša NAERLOVIĆ-VELJKOVIĆ and Prof. dr Milivoje SIMONOVIĆ.

Our XXII Yugoslav Congress of Theoretical and Applied Mechanics was a real success. Many distinguished scientist and academician from Russia, Greece, Italy, Ukraine, Romania, Bulgaria Macedoniya, Republic Serbia and our country gave very interesting lectures and presented their latest research results. The total number of Papers submitted to YUCTAM Vrnjačka Banja 97 are 322 by more than 450 authors and co-authors.

We have published 9 various collections of the congress documents:

1. Abstracts of the YUCTAM Vrnjačka Banja 97, (Serbian - English) , pp. 15+ 377;
2. Proceedings of the YUCTAM Vrnjačka Banja 97. Plenary Lectures and Invited Minisymposium Lectures - "*Nonlinearity and Chaos in Engineering Dynamics*"; "*Mathematical Methods in Mechanics*", (Serbian - English), pp.190;
3. Proceedings of the YUCTAM Vrnjačka Banja 97 - A - *General Mechanics*, (Serbian or English . with abstracts English), pp. 167;
4. Proceedings of the YUCTAM Vrnjačka Banja 97 - B - *Fluid Mechanics*, (Serbian or English - with abstracts English), pp. 226;
5. Proceedings of the YUCTAM Vrnjačka Banja 97 - C - *Mechanics of Solid Deformable Body*, (Serbian - with abstracts English), pp. 229;
6. Proceedings of the YUCTAM Vrnjačka Banja 97 - D - *Interdisciplinary and Multidisciplinary Problems*, pp.279; (Serbian - with abstracts English), pp. 482;
7. Proceedings of the YUCTAM Vrnjačka Banja 97 - MF. *Recent Advances in Fracture and Damage Mechanics*, International Minisymposium (English) pp. 170;
8. Proceedings of the YUCTAM Vrnjačka Banja 97 - MC. *Computing Mechanics*, Minisymposium, pp. 136;
9. Proceedings of the YUCTAM Vrnjačka Banja 97 - Round Table. *History of Mechanics in Yugoslavia* (Serbian - English), pp. 86;
and
10. Programme of the YUCTAM Vrnjačka Banja 97, (Serbian - English), pp. 75.

Editors-in-Chiefs of Proceedings were Academician Nikola HAJDIN, Prof. dr Vladan ĐORĐEVIĆ, Prof. dr Katica (Stevanović) HEDRIH.

The Congress program included the following Plenary Lectures (PL.) and Invited Minisymposium Lectures (MN.IL, MA.IL, MF.IL, MC.IL)

PL.1. Miomir VUKOBRATOVIĆ, Velko POTKONJAK

The role of dynamics in control of active mechanical systems and civil structures.
Značaj dinamike u upravljanju aktivnim mehaničkim sistemima i građevinskim strukturama

PL.2. Anthony N. KOUNADIS, John RAFTOYIANNIS

Dynamic buckling and stability global response of dissipative/nondissipative systems exhibiting mode coupling under static loading.

Dinamičko izvijanje i globalna stabilnost odziva disipativnih/nedisipativnih sistema sa spregnutim

opterećenjem.

PL.3. Iliya BLEKHMAN

Control the properties of nonlinear mechanical systems by the vibration.
Upravljanje svojstvima nelinearnih mehaničkih sistema pomoću vibracija.

PL.4. Guseppe REGA

Experimental finite dynamics of an elastic cable/mass suspension: Nonlinear modal interaction, bifurcation and chaos
Eksperimentalna dinamika elastičnog kabla/masa vešanja: Nelinearna modalna interakcija, bifurkacija i haos.

PL.5. Livija CVETIČANIN

Nelinearne oscilacije i haos kod jednodimenzionalnog kontinualnog sistema.
Non-linear vibrations and chaos in one-dimensional continual systems.

PL.6. Milena VUJIŠEVIĆ, Dušan KRAJČINOVIĆ

Damage Mechanics - Critical States
Mehanika oštećenja - Kritična stanja.

PL.7. Alexey Yakovlevich SAVCHENKO

Interconnected rigid bodies systems. Theory and applications.
Unutrašnje povezani sistemi krutih tela. Teorija i primene.

PL.8. Miloš KOJIĆ

On use constitutive models in finite element method.
O korišćenju konstitutivnih modela u metodi konačnih elemenata.

PL.9. Dragoslav ŠUMARAC

From plasticity and fracture to damage mechanics.
Kroz plastičnost i lom do mehanike oštećenja.

PL.10. Svetislav ČANTRAK

Turbulencija - fenomen klasične i statističke mehanike.
Turbulence-Phenomenon of classical and statistical mechanics.

PL.11. Vladimir MATROSOV

Methods of Vector Lyapunov Functions: Theory and Applications to industrial Systems.
Metoda vektorskih funkcija : teorija i primene na tehničke sisteme.

MN. IL. 11. Anthony N. KOUNADIS, Alexander F. VAKAKIS

A novel nonlinear spring-mass device for earthquake isolation of buildings.
Novo nelinearno sredstvo opruga-masa za zamljotresnu izolaciju zgrada.

MN. IL. 11, Katica (Stevanović) HEDRIH

Nelinearna dinamika rotora sa oscilujućom osom.
Nonlinear dynamics of rotor with vibrational axis.

MN. IL. 12. A BALTOV, A. ALEKSANDROV, E. MILCHEV

Multicriterial carrying capacity of impulsively loading structures.
Višekriterijski kapacitet nosivosti impulsno opterećenih struktura.

MN. IL. 9, Vladimir MATROSOV

Mathematical theory for mechanical systems with sliding friction.
Matematička teorija za mehaničke sisteme sa trenjem klizanja.

MC. IL. 2. Đorđe ZLOKOVIĆ

Formulation of mathematical models in mechanics by the group supermatrix procedure.
Formulisanje matematičkih modela u mehanici grupno supermatričnim postupkom.

MC. IL. 3. Mladen BERKOVIĆ

Mixed model of the finite element method.
Mešoviti model metode konačnih elemenata.

MF. IL. 2. Ian SMITH, Dongming TAN

Fracture in wood and design of timber structures.

MF. IL. 6. Jovo JARIĆ
On the inverse Noether's theorem in nonlinear micropolar continua.

MF. IL. 7. Aleksandar SEDMAK, Stojan SEDMAK
Weldment fracture mechanics parameters evaluation.

MF. IL. 8. S. MAKSIMOVIĆ, M. JANKOVIĆ
Effective numerical approach for initial fatigue life analysis of metallic structures subjected to general loading spectrum.

MF. IL. 9. Ružica NIKOLIĆ
O problemu prslina kod monokristala.
Stress and strain crack tip in ductile single crystals.

MA. IL. 2. Alexey Yakovlevich SAVCHENKO
Passive stabilization of dynamics systems equilibrium position.
Pasivna stabilizacija pozicija ravnoteže dinamičkih sistema.

MA. IL. 8. Anatolij Timofjevič FOMENKO
Hamiltonova mehanika i simplektička topologija.
Hamilton's mechanics and symplectic topology.

MA. IL. 1. Zoran NIKOLIĆ, Momčilo RISTIĆ
Modelovanje i simulacija procesa primenom matematičkog formalizma.
Process modeling and simulation using mathematical formalism.

MA. IL. 6. Neda BOKAN
Codazzi-jeva struktura i diferencijalni operatori na Weyl-ovim mnogostrukostima.
Codazzi structure and differential operators on Weyl manifolds

MA. IL. 7. Novica BLAŽIĆ
Lokalno-dinamičke homogene pseudo-Riemann-ove mnogostrukosti.
A local dynamic homogenous pseudo Riemannian manifolds.

Chairman of the Organizing Committee of the XXII YUGOSLAV CONGRESS OF THEORETICAL AND APPLIED MECHANICS (XXIIth YUCTAM Vrnjačka Banja 97) was Prof. dr Katica (Stevanović) HEDRIH, Mathematical Institute SANU, Belgrade and Faculty of Mechanical Engineering University of Niš.

All the Congress organizers contributed to the general success of the Congress, welcoming the participants really friendly and providing them pleasant stay in Congress Center during the meeting, as the participants themselves assured us into.

It should be mentioned that young assistants of Mathematical Institute SANU (Borislav GAJIĆ, mr Božidar JOVANOVIĆ) and young professors of the Faculty of Mechanical Engineering University of Belgrade (dr Aleksandar OBRADOVIĆ, dr Zoran GOLUBOVIĆ, dr Nikola MLADENOVIĆ, dr Miloš NEDELJKOVIĆ, dr Saša MARKOVIĆ) and other member of the Organizing team were deeply engaged in all the technical and administrative cores around the Congress. The team worked easily and very professionally, with a lot of kindness, and they made very positive impressions on the Congress participants.

We would like to particularly point out the engagement of Prof. dr Milivoje Simonović, the chief of the Chair for Mechanics of the Faculty of Mechanical Engineering University of Belgrade, who greatly contributed in providing the financial support for the Congress organization.

Between two last Congress during last four years, President of Yugoslav Society of Mechanics was professor dr Vladan ĐORĐEVIĆ, coresponding member of SANU,

Secretar-General was Professor dr Ružica NIKOLIĆ, Faculty of Mechanical Engineering University of Kragujevac.

The General Assembly of YUSM elected new members of the Presidium of YUSM. New members of Presidium of YUSM are: Prof. dr Mladen Berković, Mathematical Faculty of University of Belgrade, Prof. dr Katica (Stevanović) Hedrih, Faculty of Mechanical Engineering University of Niš, Honor Academician of Ukrainian Higher Education Academy of Sciences, Member of international Academy of Nonlinear Sciences - Moscow, Prof. dr Dragoslav Šumarac, Faculty of Civil Engineering University of Belgrade, Prof. dr Mila Kažić, Faculty of Mechanical Engineering University of Podgorica, Prof. dr Dragan Milosavljević, Faculty of Mechanical Engineering University of Kragujevac, Prof. dr Miloš Nedeljković, Faculty of Mechanical Engineering University of Belgrade, prof. dr Dečan Ivanović, Faculty of Mechanical Engineering University of Podgorica, Prof. dr Đula Mešter, Faculty of Civil Engineering Subotica, Prof. dr Dragoslav Bašić, Faculty of Mechanical Engineering University of Priština, Prof. dr Teodor Atanacković, Faculty of Technical Sciences University of Novi Sad.

New President of YUSM is now Professor dr Dobroslav RUŽIĆ, professor of Faculty of Mechanical Engineering University of Belgrade.

Yugoslav Society of Mechanics is a member of International Union of Theoretical and Applied Mechanics.

We also feel obliged to mention the names of the scientists that had been invited, but were not able to take part in the Congress, due to their other obligations. Best wishes for the Congress success and regrets for not participating personally we received from: Prof. dr Hans TROGER, Prof. dr Leen van WIJNGAARDEN, Prof. dr F.L. ČERNOUSKO, Prof. dr Kazuyuki YAGASAKI, Prof. dr D.G. GRIGHTON, Prof. dr Fabio CASCIATI, Prof. dr Jan AWREJCEWITZ, Prof. dr Dan STAMATIU, Prof. dr P.E. DOAK, Academician Valentin V. RUMJANCEV, Academician Yuriy Alekseevich MITROPOLSKIY, Prof. Dr. - Ing. W. SCHIEHLEN, Prof. Dr Carlos A. ALMEIDA, Prof. dr Andreas ACRIVOS, Prof. dr W. SZEMPLINSKA-STUPNICKA, Prof. dr S.T. ARIARATNAM, Prof. dr Philip HOLMES, Prof. dr R. HETNARSKI and other.

The next XXIII YUGOSLAV CONGRESS OF THEORETICAL AND APPLIED MECHANICS (XXIIIth YUCTAM 99) will be organized in 1999 on first week in June 1999.

K. H.