# **Organizing Committee:**

Dr. C. Goverdhan Prof.S.VijavaLakshmi Dr.M. Sunitha Dr. Rama Krishna Goud Dr. A.Venkata Lakshmi Dr.Y.Rameshwar Dr. K. Ramesh Babu Dr.E.Rama

Dr. Uma Dixit Prof. V. Dhanalaxmi Dr. P. Loka Pavani Dr. G. UpenderReddy Dr.V.Srinivas Dr. Renuka

# **Advisory Committee:**

Prof. G.Kamala

Prof.Ishak Hashim, Universiti Kebangsaan Malaysia Prof. V. D. Sharma, IIT, Bombay Prof. P. G. Siddheshwar, Christ University, Karnataka Prof. S. Motsa, University of KwaZulu-Natal, South Africa Prof. Sudhir Ghorpade, IIT, Bombay Prof. A.Ishak, University Kebangsaan Malaysia Prof. Y. N. Reddy, N.I.T., Warangal Prof. David Jeffrey, University of Western Ontariao, London, Prof. Ravi P. Agarwal, Texas A&M University-Texas Prof. P. N. Pandey, University of Allahabad Dr. Farzad Ismail, University Sains Malaysia Prof. B. Sri Padmavati, HCU, Hyderabad Prof. Pankaj Srivatsva, MNNIT, Allahabad Prof. Marneni Narahari, Universities Teknologi PETRONAS Prof. D. Srinivasacharya, NIT, Warangal Dr. Srivathsa, Addl. Director, DMRL DRDO, Hyd Prof. J.C. Umavathi, Gulbarga University, Karnataka Prof.P. Loganathan, Anna University, Chennai Prof. M. K. Sarma, GJU, Hissar, Haryana Prof. C. Sulochana, Gulbarga University, Karnataka Prof.P.K.Singh, University of Allahabad Prof. S. Saravanan, Barativar University, Coimbator Prof. Ayub Khan, JNVU, Jodhpur Prof.B.Patil Mallikarjun, Tumkur University, Karnataka Dr.B.J.Gireesha, Kuvemp University, Karnataka Dr.S. Vijayabalaji, Anna University, Tamilnadu Dr. Yogesh G. Bhumkar, IIT, Bhubaneswar Dr. Narasimha Kumar, IIT, Hyderabad. Dr. Janardan Reddy, Central University of Karnataka, Gulbarga Dr. Mahanteesha Nandepanwar, Gulberga Dr. B.C. Prasannakumara, Davanagere University, Davanagere. Dr. M. Gnaneswara Reddy, ANU, Ongole, AP

# **Objectives:**

The International Conference on Mathematics & Its Relevance to Science and Engineering (ICMRSE-2022) aims to bring together academicians, researchers and leading scientists for knowledge sharing and discuss recent developments in Mathematical aspects of Science and Engineering. It also provides the premier interdisciplinary forum for researchers, practitioners and educators to present and discuss the most recent innovations, trends, and concerns, practical challenges encountered and the solutions adopted in the field of Mathematics & Its relevance, applications to Science and Engineering subjects.

#### **Topics:**

Topics of the conferences, but not limited to, are the following:

- Mathematical Analysis
- Mathematical modeling & Differential Equations
- Computational Fluid Dynamics
- Fluid Mechanics
- Functional Analysis & Operator Theory
- Nanofluids
- Graphy Theory
- Number Theory
- Numerical Analysis & Scientific Computing
- Mathematical Biology

# Algebra

- Cryptography & Networks
- Linear Algebra
- Complex Analysis
- Financial and Industrial Mathematics
- Fuzzy Sets & Logic
- Optimization and Control

# **BEST PAPER AWARDS**

To encourage the young researchers below the age of 35 years, Prof. Meenakshi Sundaram Memorial Best Paper Award in Applied Mathematics & Prof. U.M. Swamy Best Paper Award in Mathematics will be given.

#### **Rules:**

1. The paper should be of a single author with novel ideas. 2. The author shouldn't exceed the age limit of 35 years by 30-1-2022. 3. The full length paper along with the abstract should be sent to the General Secretary, APTSMS.

#### **Call for Papers**

Full papers for the conference should be sent to icmrse2022@gmail.com written in English, prepared with MS word (Times New Roman) or LATEX format. The paper must contain a self-explanatory title, full names of authors, affiliations and email addresses. In case of multiple authors, please underline the name of presenting author. The papers presented in the conference will be published in SCOPUS/UGC recognized journal. All accepted papers which are presented in conference will be considered for publication in the journal Communications in Mathematics and Applications, ISSN 0975-8607(online); 0976-5905(print), indexed in Emerging Sources Citation Index, WoS and Iranian Journal of Numerical Analysis and Optimization (IJANO), ISSN 2423-6977 indexed in SCOPUS. The author has to bear the publication charges for the accepted papers. Hence interested research scholars can send their papers to the conference convener latest by 8th February, 2022 through the Easychair link.

#### **Registration Particulars:**

Industry	Rs. 2,500	
Academic Institutes & Faculty	Rs. 2,000	
Research Scholars/Life Members	Rs. 800	
Students	Rs. 400	
Foreign Delegates	USD 100	

The registration fee has to be paid through online by NEFT to "The Head Department of Mathematics, Osmania University, Hyderabad A/C. No: 52198268002; IFSC Code No: SBIN0020071 or DD in favour of "The Head Department of Mathematics, Osmania University, Hyderabad" payable at Hyderabad.

The authors's are advised to submit the papers through the following link Website: https://easychair.org/cfp/icmrse2022

#### Address for Correspondence:

Department of Mathematics Osmania University, HYDERABAD-7, TS, INDIA Conference E-mail: icmrse2022@gmail.com

**Contact:** 

Prof. S. Hari SinghNaik Mobile:+91-9440194616 Dr. B. Krishna Reddy Mobile:+91-9603620704

# Accommodation :

Accommodation will be arranged from outstation participants in the University Guest House.





# **ANDHRA PRADESH AND TELANGANA SOCIETY FOR MATHEMATICAL SCIENCES**

(Regd.No. 1310/1986) (C.C.No.988/2018) Regd.office : Department of Mathematics Osmania University, Hyderabad - 500007 Website: www.aptsms.org

# **XXX CONGRESS OF APTSMS**

# &

# **INTERNATIONAL CONFERENCE ON MATHEMATICS & ITS RELEVANCE TO SCIENCE AND ENGINEERING**

(ICMRSE-2022) 12th -14th FEBRUARY, 2022

**ORGANIZED BY DEPARTMENT OF MATHEMATICS OSMANIA UNIVERSITY** HYDERABAD-500007 **TELANGANA STATE, INDIA** www.osmania.ac.in



#### **ABOUT APTSMS:**

Andhra Pradesh Society for Mathematical Sciences (APSMS) was found three decades ago with the initial efforts of Late Prof. N.Ch. Pattabhi Ramacharyulu, the then Professor of Mathematics, Regional Engineering College, Warangal and Late Prof. P V. Arunachalam, the then Professor of Mathematics, Sri Venkateshwara University, Thirupathi & Former Vice-Chancellor, Dravidian University, Kuppam. Since its inception, APSMS has grown in size and it has been successfully organizing its Annual Congresses, providing a forum for research workers, young and old, to present their findings and for reviewing the state of the art in the specialized areas of Mathematical Sciences, besides bringing together academics for camaraderie and intellectual interaction. APSMS has been renamed as APTSMS (Andhra Pradesh and Telangana Society for Mathematical Sciences, 2018). This is only organization of its size devoted to Mathematical Sciences.

# **OSMANIA UNIVERSITY:**

Osmania University is a public state university in Hyderabad, India, founded in 1918 with the help of chief Architect of Mahbub Ali Khan Nawab SarwarJung. It was established and named after the seventh and last Nizam of Hyderabad, Nawab Mir Osman Ali Khan. It is the third oldest university in the southern India, and the first to be established in the erstwhile princely State of Hyderabad. It is the first Indian university to have Urdu as a medium of instruction. The Main Campus is ranked tenth among state universities, as published by India Today. As of 2012, the university hosts 3,700 international students from more than 80 nations. The OU is one of the largest university systems in the subcontinent with over 300,000 students on its campuses and affiliated colleges. It is particularly known for its faculty of Engineering and Technology, Law, Arts, Sciences, Commerce and Management departments. The main campus is a chief intellectual centre in Hyderabad, and its alumni and faculty members include many distinguished individuals, including former Prime Minister of India P.V. Narasimha Rao. The University is accredited by the NAAC with an 'A+' grade and conferred with the status of University with Potential for Excellence' by the UGC, New Delhi. In the year 2018 the university is celebrated 100th anniversary. Thus sustained an integrated development of all faculties and contributed to the academic, research, social and economic development across the globe.

# **ABOUT THE MEMBERSHIP OF APTSMS**

Corporate membership: Rs. 5000(For Institutions/ Organization/ Educational Institutions)Corporate members can depute two membersas delegates to the Annual CongressLife Membership Fee: Rs. 1,000Annual Membership Fee: Rs. 300Student Membership Fee: Rs. 100For payment of membership fee, please visit the APTSMS websitewww.aptsms.org. For further information may be contact

# Prof. E. Keshava Reddy

President of APTSMS, Dept. of Mathematics, JNTUA, Ananthapuram Email: keshava.maths@jntua.ac.in Mobile: 9440228484

#### Prof. D. Bharathi,

General Secretary of APTSMS Department of Mathematics S.V. University, Tirupati Email: bhrathikavali@gmail.com Mobile: 9440343888

## **APTSMS EXECUTIVE COUNCIL:**

Prof. E. Keshava Reddy
Dr.A.Chandulal
Dr. G. Upender Reddy
Prof.D.Bharathi

a Reddy President I Vice President Reddy Vice President i General Secretary Capt Dr. N.Rama Krishna Dr.P.Narasimha Swamy

#### **MEMBERS:**

Prof. T.Srinivas, Dr. P.Chandrakala, Dr. Meera Joshi, Prof. K. Suvarna Dr. K.V.S. Sarma Dr. S. Balasubramaniyan Dr. C.Venkata Lakshmi Dr. V.Rajesh Dr. K.Vijay Kumar Dr. M.C. Raju Dr. K.Ramesh Babu Dr. B. Satyanarayana

## **ENDOWMENT LECTURES:**

- 1. Prof. N.V. Subramanyam Endowment Lecture in Algebra, Sponsored by Prof.N.V.Subramanyam Shashthyabdipurti Felicitation Committee.
- 2. Prof. Kesiraju Satyanarayana memorial Lecture in Geometry, sponsored by Prof. N.Ch. Pattabhi Ramacharyulu.
- 3. Endowment Lecture in Number Theory, sponsored by Prof. K.P.R. Sastry.
- 4. Sri. D. Venkatachari memorial Lecture in Applied Mathematics, sponsored by D.V. Krishna and his brothers
- 5. Prof.S.N.N. Pandit Endowment Lecture in Applied Statistics, sponsored by Prof. V.V. Haragopal.
- 6. Prof. R. Vaidyanatha Swamy memorial Lecture in Pure Mathematics, sponsored by Prof. V.V.Subramanya Sastry.
- Smt& Sri G.P.Sharma memorial Lecture on Theoretical Computer Sciences, sponsored by Dr. G. Lalitha.
- 8. Prof. M.L. Narayana Rao memorial Lecture in Algebra and its Applications to Geometries, sponsored by his students.
- 9. Prof. A. Kanduri Lakshmi Narasimha Swamy Endowment Lecture in Algebra and Applications, sponsored by Prof. K.L.N. Swamy Felicition Committee.
- 10. Prof. A. Radha Krishna Endowment Lecture in Algebra, sponsored by his students Prof. T. Srinivas and Dr. K. Yughandhar.
- 11. Lecture in honor of Prof. N. Ch. Pattabhi Ramacharyulu,, one of the Founder Members of APSMS instituted by some Life Members of APSMS, Admirers and Research Associates of Prof. N. Ch. Pattabhi Ramacharyulu.
- Prof. Bhavanari Satyanarayana Endowment Lecture in Algebra, sponsored by his research scholars and students.
- 13. Prof. P.V. Arunachalam Endowment Lecture in Mathematics/ Applied Mathematics, sponsored by the staff of the Department of Mathematics, S.V. University, Tirupati.
- 14. Prof. Kuncham Syam Prasad and, Prof. Bhavanari Satyanarayana Endowment Lecture on Gamma-Near-Rings, sponsored by Mr. Mallikarjun Bhavanari and Mrs. Jaya Lakshmi Bhavanari.
- 15. Prof. B.Maheswari Endowment Lecture in Graph theory, sponsored by her research scholars, Sri Padmavati Mahila Visvavidyalayam, Tirupati.
- Prof. T. Srinivas Endowment Lecture on Near-Rings, sponsored by his students Dr. T. Nagaiah and Dr. P. Narasimha Swamy.
- 17. Prof. Sreedharamalle Sreenadh Endowment lecture in Applied Mathematics, sponsored by Dr. A.N.S. Srinivas and Dr.R. Hemadri Reddy.
- 18. Prof. Davuluri Ramakotaiah, Prof. Yenumula Venkateswara Reddy and Prof. Bhavanari Satyanarayana Endowment lecture on Near rings, sponsored by Mr. Mallikarjun Bhavanari and Mrs.Jayalakshmi Bhavanari.
- 19. Prof. G.C. Rao Endowment lecture in Algebra, sponsored by his student Dr. G. Nanaji Rao.
- 20. Prof. Bhavanari Satyanarayana and Dr. Sriramula Eswaraiah setty Endowment Lecture in Mathematics, sponsored by Mrs. Jaya Lakshmi Bhavanari and Mrs. Vijaya Lakshmi Sriramula.
- 21.Prof. Bhavanari Satyanarayana, Prof. Sreedharamalle Sreenadh and Prof. Thota Srinivas Endowment Lecture in Mathematics Sponsored by Mrs. Jaya Lakshmi Bhavanari, Mrs. Sitamahalakshmi Sreedharamalle and Dr.K. Vijay Kumar.

22. Prof. K. Suvarna Endoment Lecture in Algebra and its Applications, sponsored by Dr.C. Jaya Subba Reddy, S.V.U, Tirupati.

- 23. Prof. Bhavanari Satyanarayana, Prof. Kuncham Syam Prasad and Dr. K.B. Srinivas, Endowment Lecture on Near Rings and related Algebraic Structures, sponsored by Mrs.B.Jaya Lakshmi, Mrs.B. Anitha, Mrs.V. Narayana Bhat.
- 24. Prof. S. Vijay Kumar Varma endowment lecture in the field Vedic Mathematics / Applicable Mathematics sponsored by Dr. K. Nagamanemma, Prof. S.Anand Kumar Varma, Dr. V. Rajesh, Prof. K. S. Balamurugan and Prof. M. Chengal Raju.
- 25. Prof.U.M.Swamy Endowment Lecture In Algebra Sponsered by Prof. Ch.Santhi Sunder Raj and his Research Students
- 26. Prof.Nyalakonda Gopal Reddy Endowment Lecture in Functional Analysis and Operator Theory Sponsored by Prof.B.Surender Reddy, Prof.B.Krishna Reddy, Dr.G.Upender Reddy and Dr.D.Sudheer Reddy.



## **About The Department of Mathematics:**

The Department of Mathematics is one of the few departments initiated at the time of inception of Osmania University. It has earned reputation for high level academic and research activities across the universities situated in and around the globe. The Department of Mathematics specializes in Mathematics, Applied Mathematics and Computer Science. It offers M.Sc and Ph.D programs. In recognition of its teaching and research activities the UGC has awarded DRS Phase-I for the period 1994-99, DRS Phase-II from 2002-07, UGC COSIST programme for the period 2002-07, DRS Phase-III for the period 2007-12 and upgraded to DSA Phase-I for the period 2013-18.

### **Chief Patron**

Prof. D. Ravinder, Hon'ble Vice-Chancellor, OU.

#### Patrons

Prof. P. Laxminarayana, Registrar, OU Prof. Reddya Naik, OSD to VC, OU Prof. G.Mallesham, Dean, Development & UGC Affairs Prof. Balakishan, Dean, Faculty of Science, OU Prof. B. Veeraih, Principal, UCS, OU

# Convener

Prof. N. Kishan Head & Professor of Mathematics, Osmania University

#### Co-convener Prof. B.Surender Reddy, BoS in Mathematics, OU

Organizing Secretaties: Prof. S. Hari Singh Naik, Dr. B. Krishna Reddy

ımar

#### Joint Organizing Secretaries:

Dr. K. Sriram Reddy,	Dr. K. Phaneendra,
Dr. A. Venkata Lakshmi,	Dr. CH. Kishore Ku
Dr. V. Kiran	

Treasurer: Dr. V. Nagaraju

Office Secretary Treasurer

> (Ex.Officio) (Ex.Officio) (Ex.Officio) Co-Opted member