

A Brief Introduction about Indian National Cartographic Association

Founded on 7th August, 1979 at Hyderabad, the Indian National Cartographic Association (INCA) has evolved into one of the biggest organisations of its kind in the world. From a modest beginning with 79 members on its role initially, today it is a professional body with more than 3000 Life Members and 84 Institutional Life Members. It has Branches functioning at Bangalore, Bombay, Calcutta, Chandigarh, Dehra Dun, Delhi, Gujarat, Hyderabad, Indore, Jodhpur, Kerala, Orissa and Tamil Nadu.

INCA is devoted to the cause of cartography as a graphic mode of communication. It has in its fold many eminent scholars, professionals and industrialists as Honorary Fellows, Life Fellows, Life Members, Members, Associate Members and Student Members. The majority of its members are practicing Cartographers from multiple premier organisations, universities and private bodies.

The objectives of INCA are as follows:

- To foster cartographic research in the country
- To co-operate with professional organisations of cognate disciplines and to promote interaction within an inter-disciplinary frame
- To co-operate with international organisations with similar objectives
- To improve the teaching of cartography at all levels
- To foster co-operation between government and quasi-government organisations, research institutions engaged in cartographic activities and their application
- To hold Cartographic congress, generally once in a year
- To take such measures as may help secure for cartography its legitimate place in national life and enhance a sense of national responsibility and professional efficacy among all the professionals and academic people engaged in cartographic activities in its broad sense

More information about INCA can be found at <http://www.incaindia.org/>

In order to achieve the above objectives, INCA organises several programmes. It has so far conducted 42 National/ International conferences at various places across India. These conferences are attended by experts from not only India but also from other countries. The conference provides an ideal platform for interaction among professionals, academicians and scientists engaged in cartographic activities, presentation of their work and discussing important issues concerning cartographic profession.

The Executive Committee of the INCA guides to realise the objectives of the association. The executive committee during the year 2023 is as follows:

President:	Dr. Prakash Chauhan
Co-President:	Shri Sunil Kumar
Past President:	Vice Admiral Adhir Arora, AVSM, NM
Senior Vice-President:	Shri S. V. Singh
Vice-Presidents:	Shri K. Sajikrishnan K, Dr. Bimal Kumar Kar & Rear Admiral L. S. Pathania
Secretary General(s):	Shri Pankaj Singh Kalam
Secretary – I:	Dr. K. Pramod Kumar
Secretary – II:	Shri Rajesh Kumar Khatri
Treasurer:	Shri P. Krishnaiah
Chairman Editorial Board:	Prof. (Dr.) V. C. Jha
Members:	Brig. S. Sridhara Rao, Shri S. K. Sinha, Commodore Peush Pawsey, Dr. R. A. Prasad, Dr. B. K. Ramprasad, Shri Amithab, Dr. Vandita Srivastava, Dr. Swampna Saha, Ms. Anjana Bandyopadhyay, Dr. Gaurav Kalotra, Dr. Shukla Hazra, Dr. Sucheta Mukherjee`

About 43rd INCA International Congress

The 43rd INCA International Congress is focussed on the theme "Emerging Trends in Digital Cartography for Sustainable Ecosystems and Geospatial Economy" and scheduled during 06–08 November 2023 at Jodhpur, Rajasthan, India. The event is being organised by Indian National Cartographic Association (INCA) and hosted by National Remote Sensing Centre (NRSC), ISRO at Regional Remote Sensing Centre – West (RRSC-West), Jodhpur. The conference anticipates offering a truly inspiring, learn from each other's experiences and partnership on the theme which is important for many ongoing development programmes in the present scenario.

Modern Cartography and geospatial services have a significant impact on all aspects of everyday life and are well recognised for their utility in service of social, economic and environmental development. Recent advancements in the usage of Drones and digital innovation such as artificial intelligence have brought new and innovative solutions to pressing global problems. Faster and more versatile digital connectivity, satellite data, geographic information systems and spatial analysis have become increasingly accessible and available, generating more evidence-based data to support real-time decision-making. Geospatial information is being increasingly incorporated into development initiatives, leading to effective and efficient planning, monitoring and evaluation of development interventions. Realising the potential of geospatial technology, many non-governmental enterprises are now getting engaged in space-based entrepreneurship.

The deliberations of the 43rd INCA International Congress are focussed on the following sub-themes:

- Advances in cartography and geospatial technology for natural resource management and smart governance
- Sustainable agriculture, food security and green economies
- Sustainable water resource management
- Environment and energy security
- Urban studies and infrastructure planning & development
- Meteorology and climate change
- Disaster resilience and emergency management
- Hydrographic surveys, coastal zone management and oceanography
- UAV applications and advances in digital image processing
- Emerging trends in AI/ML for cartography and geospatial applications
- India's space and geospatial policies for enhancing entrepreneurship and geospatial economy

The inaugural programme was held at ICAR-CAZRI Auditorium, CAZRI Campus, Jodhpur on 06 November 2023. The programme started with invocation and lighting of lamp by the Chief Guest Prof. (Dr.) K. L. Shrivastava, Vice-Chancellor, Jai Narain Vyas University, Vice Admiral Adhir Arora, AVSM, NM, Chief Hydrographer to the Govt. of India, NHO, Shri Shantanu Bhatawdekar, Scientific Secretary and Dr. Prakash Chauhan, President, INCA /Director, NRSC, Hyderabad. During the inaugural session, 43rd INCA Souvenir cum Compendium of Abstracts, 42nd INCA Proceedings, Volume of Indian Cartographer, and Space Image Atlas of Rajasthan were released by the Chief Guest. The winners (first three positions) of INCA National Map Quiz 2023 were given the trophies by the Chief Guest. As a

part of 43rd INCA congress, Todar Mal Memorial lecture was delivered by Lt. Gen. Girish Kumar, VSM (Retd.), Advisor (PP & R), Ministry of External Affairs, Former Surveyor General of India on the topic “Digital Cartography for Land Records Modernization in India.” S. P. Chatterjee Memorial lecture was delivered by Shri Shantanu Bhatawdekar, Scientific Secretary, ISRO on the topic “Space for Sustainable Ecosystems and Geospatial Economy.” 190 oral and 46 poster presentations were made through 20 technical sessions.

As a part of sponsors presentation session on Day 1, which was moderated by Shri Shantanu Bhatawdekar, Scientific Secretary, ISRO the following industries have showcased their products and services:

- Haryana Space Applications Centre (HARSAC)
- ESRI
- Trimble
- Pan India Consultants Pvt. Ltd.
- Vassar Labs

Plenary sessions were held on Day 2 & 3 as a part of the conference and the lectures/talks were as below:

- "Hydrography-The Blue Chakra for Green Planet" by Vice Admiral Adhir Arora, AVSM, NM Chief Hydrographic Officer, NHO
- "CORS Network and Geoid Modelling – Redefining National Geodetic Reference Framework" by Shri. S. K Sinha, Addl. Surveyor General (Tech.), Survey of India
- "Digital Twin for Resilient and Sustainable Infrastructure" by Dr. Sajid Sirja Malik, Chairman/Managing Director, Genesys Intl. & Co-Chair FICCI National Council of Geospatial Technology
- "Impact of Climate Change on Himalayan Glaciers: Geospatial Retrospective" by Prof. (Dr.) Anil V. Kulkarni, Distinguished Visiting Scientist, IISc
- "NISAR: A future Mission for Monitoring Earth’s Ecosystem Dynamics" by Dr. Raj Kumar, Project Lead (India), NISAR Mission
- "Geospatial Economy - Prospects and Challenges" by Dr. Shivangi S Somvanshi, Director, Geospatial Knowledge Infrastructure, Geospatial World

In addition to the plenary sessions, a popular talk on "Chandrayan-3: Unravelling the Moon’s Origin" by Dr. Nilesh Desai, Director, Space Applications Centre (SAC) and a special talk on "Bhoonidhi: ISRO’s EO Data Hub" by Mrs. Manju Sharma & Team, NRSC were delivered.

During day 3, a panel discussion on the topic “Roadmap for Strengthening Geospatial Ecosystem for National Development” was held with the eminent panellists from academia, industry and government departments which were moderated by Dr. Prakash Chauhan, President, INCA/Director, NRSC. The following are the panellists.

- Dr. M. P. Punia, Head, Dept. of Remote Sensing, Birla Institute of Scientific Research
- Dr. Debapriya Dutta, Adviser & Head of Scientific Divisions (HOD), SEED and State S&T Programme (SSTP), Department of Science & Technology (DST)
- Dr. S. P. Aggarwal, Director, North Eastern Space Applications Centre (NESAC)
- Dr. N. Aparna, Group Director, NDC, NRSC
- Prof. Mukund D. Behera, IIT – Kharagpur
- Dr. V. S. S. Kiran, Chief Executive Officer, Garudalytics Private Limited



Presidential address by Dr. Prakash Chauhan during the inaugural session of the 43rd INCA International Congress on 06 November 2023.



Release of Souvenir cum Compendium of Abstracts during the 43rd INCA International Congress on 06 November 2023. (Left to Right) – Dr. S.K. Srivastav, Dr. Prakash Chauhan, Vice Admiral Adhir Arora, Prof. (Dr.) K.L. Shrivastava, Shri Shantanu Bhatawdekar, and Dr. A.K. Bera.



Opening of the exhibition hall during the 43rd INCA International Congress on 06 November 2023. (Left to Right) Vice Admiral Adhir Arora, Shri Shantanu Bhatawdekar, and Dr. Prakash Chauhan.



Dignitaries interacting with the exhibitors during the 43rd INCA International Congress on 06 November 2023.

The Host Organisation and Organising Team

The 43rd INCA International Congress is being hosted by National Remote Sensing Centre (NRSC), ISRO at Regional Remote Sensing Centre – West (RRSC-West), Jodhpur. NRSC, a key functionary of Indian Space Research Organisation (ISRO), is striving to realize the Indian Space Vision through Earth observation. It is responsible for the ground segment of Remote Sensing Programme through satellite data acquisition, archival, processing, dissemination, remote sensing applications, training and capacity building. It also provides aerial services in the civilian sector for the country. NRSC has five Regional Centres located at Bengaluru, Nagpur, Kolkata, New Delhi and Jodhpur to address region/area specific remote sensing application needs. NRSC is continuously exploring the practical use of remote sensing for societal applications and disaster management through multilevel initiatives, development of value-added data services and remote sensing applications.

Regional Remote Sensing Centre - West (RRSC-West), Jodhpur was established in 1987 under the aegis of National Natural Resources Management System (NNRMS) of ISRO to cater to the needs of different user agencies of North-West India. The centre is acting as a hub of space technology applications in the region during the last three and half decades, with current focus on sustainable arid ecosystems having major emphasis on desertification and water resources management.

Two main committees – National Advisory Committee and Local Organising Committee – have been responsible for guiding and executing various activities of 43rd INCA International Congress.

National Advisory Committee:

Dr. S. Somanath, Secretary, DOS & Chairman, ISRO, Bengaluru
Dr. O. P. Yadav, Director, CAZRI, Jodhpur
Vice Admiral Adhir Arora, AVSM, NM, Chief Hydrographer to the Govt. of India, Dehradun
Prof. Santanu Chaudhury, Director, IIT, Jodhpur
Shri R. V. Hara Prasad, Director, Defence Lab, Jodhpur
Dr. Thamban Meloth, Director, NCPOR, Goa
Dr. Nilesh M. Desai, Director, SAC, Ahmedabad
Shri Shantanu Bhatawdekar, Scientific Secretary, ISRO, Bengaluru
Shri Sunil Kumar, Joint Secretary, DST & SGI-SOI, Dehradun
Dr. R. P. Singh, Director, IIRS, Dehradun
Dr. Shailesh Nayak, Director, NIAS, Bengaluru
Dr. Tapti Banerjee, Ex-President, INCA
Dr. V. C. Jha, Former - VC, TMBU & Director, NATMO
Dr. S. P. Aggarwal, Director, NESAC, Shillong
Prof. J. L. Jain, Ex- President, INCA
Prof. K. L. Shrivastava, VC, JNVU, Jodhpur
Prof. Krishna Mohan, Ex-President, INCA
Dr. Prakash Kumar, Director, NGRI, Hyderabad
Maj. Gen. (Retd.) M. K. Tayal, Ex-President, INCA
Shri M. R. Baloch, IFS, Director, AFRI, Jodhpur
Shri Janardan Prasad, Director General, GSI, Kolkata
Dr. Virendra Kumar, Assistant Director (PP), LWO, Jodhpur
Prof. Ajay Kumar Sharma, VC, MBM University, Jodhpur
Dr. Madhu Raikwar, Director, CBHI, MoHFW, New Delhi

Local Organising Committee:

Patron:	Dr. Prakash Chauhan, NRSC/ISRO
Chairman:	Dr. S. K. Srivastav, RCs, NRSC/ISRO
Organising Secretary:	Dr. A. K. Bera, RRSC-West, NRSC/ISRO
Co-Organising Secretary:	Dr. P. C. Moharana, ICAR-CAZRI
Treasurer:	Shri Sagar Subhashrao Salunkhe, RRSC-West, NRSC/ISRO
Editor:	Dr. Dandabathula Giri Babu, RRSC-West, NRSC/ISRO
Member Secretary:	Shri Gaurav Kumar, RRSC-West, NRSC/ISRO
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Sub-committees for 43rd INCA International Congress:

Coordination & Secretariat Management Committee

Chairman / Organising Secretary (LOC, 43 rd INCA):	Dr. A.K. Bera, RRSC-W, Jodhpur
Alternative Chairman / Co-Organising Secretary (LOC, 43 rd INCA):	Dr. P.C. Moharana, ICAR-CAZRI, Jodhpur
Members:	Dr. Rakesh Paliwal, RRSC-W, Jodhpur Shri Ashish Kumar Jain, RRSC-W, Jodhpur
Member & Editor (LOC, 43 rd INCA):	Dr. Dandabathula Giri Babu, RRSC-W, Jodhpur
Member Secretary / Event Secretariat – Focal Point (LOC, 43 rd INCA):	Shri Gaurav Kumar, RRSC-W, Jodhpur

Technical Committee

Chairman:	Dr. S.S Rao, NRSC
Members:	Dr. S. C. Jayanthi, NRSC Dr. V.M. Chowdary, NRSC Dr. Venkata Ramana Muvva, NRSC Shri K. R. Hebbar, RRSC-S Dr. G. Sreenivasan, RRSC-C Shri Suparn Pathak, RRSC-E Dr. Sameer Sareen, RRSC-N Dr. Rakesh Paliwal, RRSC-W Dr. A. O. Varghese, RRSC-C Shri Rajiv Kumar, NRSC Dr. Srinivasulu J, NRSC Shri Narendran J, NRSC Dr. Arindam Guha, RRSC-E Shri K. Nagajothi, RRSC-S Shri M. Arulraj, NRSC Shri S.S. Rajashekhar, RRSC-NRSC Dr. S. Rama Subramoniam, RRSC-S
Member Secretary:	Dr. Dandabathula Giri Babu, RRSC-W

Stage/Hall & Session Management, Exhibition & Publication Committee

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Members:	Smt. Anju Bajpai, RRSC-C Shri S.S. Rajashekhar, RRSC-NRSC Dr. S. Rama Subramoniam, RRSC-S Shri Hansraj Meena, RRSC-W Shri Abhinav Kumar Shukla, RRSC-N Shri Sushilkumar B. Rehpade, RRSC-C Shri Gautam Kumar, NRSC Dr. Dilesh Chatterjee, INCA-Jodhpur Chapter Shri Kuldeep Singh Rathore, INCA-Jodhpur Chapter Shri Shambhu Singh Tak, RRSC-W Shri Ojha Anil Kumar, RRSC-W
Member Secretary:	Shri Rakesh, RRSC-W

Reception, Accommodation, Transport & Logistics Committee

Chairman:	Shri Gaurav Kumar, RRSC-W
Members:	Shri Ashish Kumar Jain, RRSC-W Shri Om Prakash Sharma, RRSC-W Shri Shambhu Singh Tak, RRSC-W Shri D.R. Choudhary, RRSC-W Shri Subhajit Roy, RRSC-W Shri Prem Raj Pandit, RRSC-W
Member Secretary:	Shri Ojha Anil Kumar, RRSC-W

Registration & Help Desk Committee

Chairman:	Shri Ashish Kumar Jain, RRSC-W
Members:	Shri Sagar Subhashrao Salunkhe, RRSC-W Shri Rakesh, RRSC-W Dr. Prabhjot Kaur, RRSC-N Dr. Neetu, RRSC-N Shri Shashikant Sharma, RRSC-W Dr. Arjun Lal Meena, JNVU, Jodhpur Shri D.R. Choudhary, RRSC-W Shri Subhajit Roy, RRSC-W
Member Secretary:	Shri Manish Kumar Verma, RRSC-W

Catering, Cultural Programme & Purchase Committee

Chairman:	Dr. Rakesh Paliwal, RRSC-W
Members:	Shri Hansraj Meena, RRSC-W Shri Sagar Subhashrao Salunkhe, RRSC-W Shri Gautam Kumar, NRSC Shri Shambhu Singh Tak, RRSC-W Shri D.R. Choudhary, RRSC-W Shri Prem Raj Pandit, RRSC-W Shri Ch. Bhaktavatsalam, NRSC
Member Secretary:	Shri Om Prakash Sharma, RRSC-W

Fund Raising Committee

Chairman:	Dr. Sameer Sareen, RRSC-N
Members:	Dr. Pondari Satyanarayana, NRSC Shri P. Krishnaiah, NRSC
Member Secretary:	Shri Sagar Subhashrao Salunkhe, RRSC-W

Support from INCA Jodhpur Local Chapter

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Vice President	Shri Kuldeep Singh Rathore, LBN, Jodhpur
Secretary cum Treasurer:	Dr. Mahesh Kumar Gaur, ICAR-CAZRI, Jodhpur
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