

Satellite Altimetry and Instrumentation for Oceanography

(12th – 16th December 2016)

Overview

Satellite remote sensing is one of the most utilized and reliable techniques in Earth observations and resource exploration. With advantages of high spatio-temporal resolution and global coverage, it has emerged as a pioneering tool for researchers, industrialists, resource managers, earth resource explorers, policy planners, academicians and the common man to address multi-disciplinary applications including economic & strategic.

In the background of the issues relating to rapid climate change (e.g. sea level rise), extreme weather events (floods, inland & coastal inundation and erosion) with an ever increasing demand on utilization of natural resources in the form of oil and gas deposits, minerals and mining; space-borne altimeter and gravimetry missions by India and other nations have attained a huge significance. However, utilization of these tools for maximum benefit calls for expertise in the area to resourcefully use the available satellite missions for the benefit of the country and society at large.

This course aims in this direction and envisages exposing and training an interested group of manpower including students from various backgrounds in this very relevant and apt field, empowering them with the latest tools and techniques available for earth observations and resource exploration. It will involve interesting lectures along with hands on training on handling satellite data with special reference to altimetry. The course consists of two modules that need to be taken together. Module A will provide an overview of various instruments in use for monitoring the oceans along with certain state-of-art technology & instrumentation for ocean-atmosphere-land applications. Module B will deal on specific applications of Satellite Altimetry and its importance in the present world scenario.

Internationally acclaimed academicians, researchers and practitioners with proven knowledge, experience, and demonstrable ability in teaching, consultancy, research, and training in this field will deliver lectures and impart training in the proposed course. Demonstrations of ocean instruments, case studies and assignments in addition to lectures as well as hands-on training on applications and knowledge sharing by a team of renowned International and National experts in the field who are involved right from conception & designing of altimetry missions to their applications in daily life is the forte of this course.

Modules	A: Basics of Oceanography & Instrumentation : Dec 12, 2016 Basics of Oceanography & Instrumentation Ocean Dimensions; Physical properties of sea water and their measurements Methods & Approaches of In situ data collection Instruments for measurement of Physical Properties of Sea-water B: Satellite Oceanography : Dec 13 - Dec 16, 2016 Satellite Oceanography: Past, Present, Future Fundamentals of Satellite Altimetry; Satellite (Radar) Altimetry in operation: Coastal and Open Ocean Satellite observations and validation; Overview of some Altimetry & Gravimetry Missions Multi-Disciplinary Applications of Altimetry: Ocean Heat Content, Ocean Mean Temperature, Meteorological Studies, Climate Change; Satellite Altimetry: Summary and Prospects
Who should attend...	<ul style="list-style-type: none">▪ Oceanographers, atmospheric scientist or aspiring to be one with interest in satellite missions for ocean exploration, altimetry applications in climate research, natural resource exploration, or simply interested in state-of-the art science & technology in this field.▪ Student or faculty from academic or research institutions interested to learn directly from the experts in the field of ocean instruments and satellite oceanography.▪ Personnel involved in navigation, shipping, inland waterways, coastal and open ocean resource exploration or maritime policy formulation, planning, evaluation; or an NGO dealing with the above.▪ Students of B.E./B.Tech./M.Sc./PhD/Post-Docs/JRF/SRF/RA/Early Career Scientists from varying disciplines including Physics, Mathematics, Oceanography/Marine Sciences, Atmospheric Sciences, Instrumentations, Geoinformatics, Remote Sensing, etc.
Fees	The participation fees for taking the course is as follows (Participants from): Abroad : US \$ 500 Industry/Research Organizations : Rs. 3000 (Govt.), Rs. 6000 (Private) Academic Institutions (Faculty/ Scholars/RAs): Rs. 2000, UG & PG Students/Any other : Rs. 1500 Above fee includes instructional materials, tutorials and assignments, internet facility during class hours. The participants will be provided with single/double bedded accommodation on payment basis and availability. There is no travel support for participants available as of now, but is being explored. Online registration by paying web registration fee is mandatory for all participants in addition to participation fee given above. For any queries regarding registration or other information, please contact the course coordinator. Register online at: http://www.gian.iitkgp.ac.in/GREGN (Deadline: 25 November, 2016) Bank details for online payment of course registration fee: A/C Name: CEP, IIT Bhubaneswar; A/C No: 24282010001960; IFSC Code: SYNB0002428 Bank Name: Syndicate Bank Branch; Address: Indian Institute of Technology (IIT), Bhubaneswar

The Faculty



Dr. Stefano Vignudelli is a researcher at the Consiglio Nazionale delle Ricerche (National Research Council) in Pisa, Italy. He has over 20 years of scientific experience in the area of satellite remote sensing (radar altimetry, in particular) and ocean instrumentation for studying coastal and marine/inland environments including water level variability. Dr. Vignudelli's most significant accomplishment has been to lead development of satellite radar altimetry in challenging areas of the coastal zone to provide improved

measurements for water level research and applications. He is the co-editor of the Springer Book "Coastal Altimetry" (20 chapters, 70 people involved), co-author of three book chapters and over 50 research publications. He is also the associate editor of the Elsevier Advances for Space Research Journal. Dr. Vignudelli has been one of the organizers of a regular series of coastal altimetry workshops (Silver Spring 2008, Pisa 2008, Frascati 2009, Porto 2010, San Diego 2011, Riva del Garda 2012, Boulder 2013, Lake Constance 2014, Reston 2015), and is actively involved in international cooperation with developing countries through joint projects, exchange visits, workshops and capacity building. He is a member of many scientific committees and international societies.



Prof. P. C. Pandey, an Emeritus Professor at School of Earth, Ocean and Climate Sciences at IIT Bhubaneswar, specializes in Satellite Oceanography/Atmospheric Sciences, Polar Research, Climate Change Science, Remote Sensing, and Disaster Management. Earlier, he served as Emeritus Professor at CORAL, IIT Kharagpur and as a Senior Resident Research Associate at Jet Propulsion Laboratory (NASA). Prof. Pandey was the Founder Director of National Centre for Antarctic and Ocean Research (NCAOR/MoES), and Founder Head of the Ocean Sciences

Division at Space Applications Centre (Indian Space Research Organisation). Recipient of the coveted **Dr. Shanti Swarup Bhatnagar Award** in Earth, Ocean, Atmosphere and Planetary Sciences in 1989, Certificate of Recognition at NASA, and Hari Om Ashram Prerit Dr. Vikram Sarabhai Research Award, among many others, he has many scientific patents and more than 130 publications (100+ in referred journals) 25 books and encyclopedia chapters, technical reports and Atlases to his credit. He has also guided 12 PhDs and several M.Tech. & M.Sc. thesis.



Dr. M. M. Ali is the Courtesy Senior Scientist at Center for Ocean-Atmospheric Prediction Studies, Florida State University, USA. Prior to this, he was Dr. Brahmaprakash Professor at National Remote Sensing Centre (NRSC) of Indian Space Research Organisation (ISRO), and also served as Group Director of Atmosphere and Ocean Sciences Group at NRSC, former Head of Oceanography Division at NRSC and the Project Manager for MSMR Validation at Space Applications Centre, ISRO. His areas of specialization include Remote Sensing

with special reference to Satellite Altimetry, Ocean-atmosphere interaction and Equatorial Indian Ocean dynamics. He has also served as Adjunct, Visiting and Honorary Professor at various academic Institutions of repute. With more than 35 years of experience in the field, Dr. Ali has produced many PhDs, published more than 70 research papers and a number of technical reports and atlases.



Dr. R. K. Nayak is a Scientist and Head of the Ocean & Integrated Biogeochemical Modeling Division at National Remote Sensing Centre, ISRO, Hyderabad. With a Ph.D. in Physics from Goa University under the UGC-CSIR JRF programme and more than 26 research publications, he is an expert in physical oceanography and remote sensing applications for earth system studies. Dr. Nayak also has more than a decade long post-doctoral experience within ISRO in various capacities and has contributed extensively on the understanding & modeling of the coastal circulation and regional carbon cycle of terrestrial India. He has been

honoured with **Prof. P. R. Pisharoty Memorial National Remote Sensing Award** in 2015.



Dr. D. Swain, an Assistant Professor at IIT Bhubaneswar, holds a Ph.D. degree in Atmosphere and Space Sciences and has more than 14 years of research experience at Indian Space Research Organisation (ISRO), Indian National Centre for Ocean Information Services and IIT Bhubaneswar. He works in the field of satellite oceanography with specific interest in applications of space sciences for ocean and climate research. He has more than 35 publications, including book chapters, reports and atlases, and is a recipient of two

International Young Scientist Awards and several research grants.

Host Faculty and
Coordinator

Dr. D. Swain

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