

Education & Training Activities. IEEE-GRSS Perspectives and Efforts in South America

Synthetic Aperture Radar Literacy and Training Workshop
October 22-24, 2018 Westin Denver International Airport

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LUXEMBOURG
INSTITUTE OF SCIENCE
AND TECHNOLOGY



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Luxembourg Institute of Science and Technology (LIST)
Environmental Research & Innovation (ERIN)
Remote Sensing and Natural Resources Modelling Group

- What do you do related to **SAR** or **big data**?
 - Remote sensing and Synthetic Aperture Radar theory and applications
- Who is your primary **constituency/audience**?
 - Under-graduate, graduate, researchers & professionals
- How were you **introduced to SAR**?
 - My work in Synthetic Aperture Radar started with my PhD in 2000

IEEE-GRSS Education & Training Activities

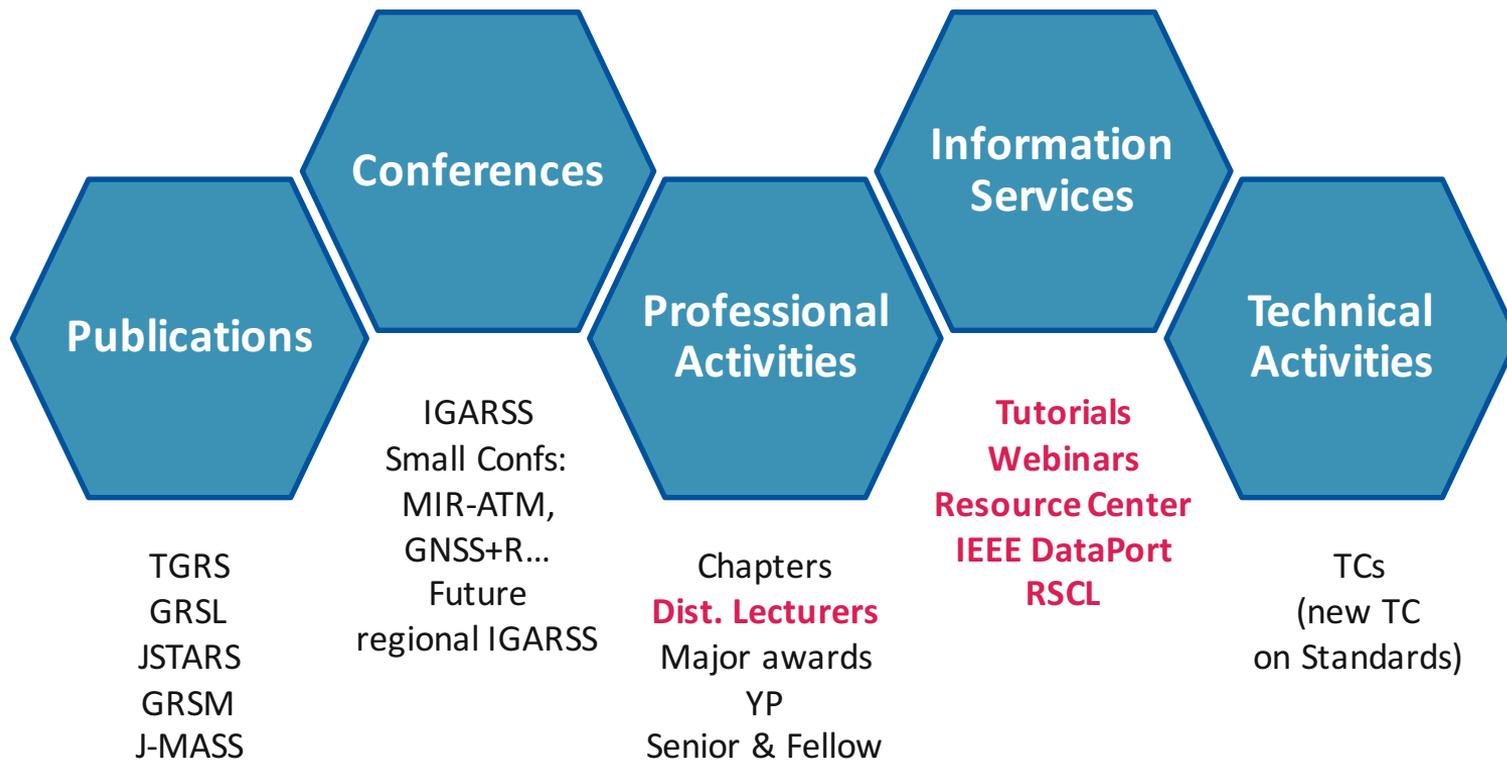
- Description of Activities
- Training Material

Training Activities in South America

- Description of Activities

Conclusions & Learnt Lessons

Elements of GRSS



Background

- GRSS is a IEEE **technical society** that deals with: **Remote Sensing** and **Geospatial Information**, both Science and **Engineering & Applications** and **Education**, working for societal benefits through remote sensing
- GRSS has more than **3400 Members** in **94 Countries**, and **65 chapters**: that is 3 new chapters and 2 new student branch chapters than last year



6 Student branches (📍)

11 Ambassadors (👤)

<http://www.grss-ieee.org/community/chapters/>

IEEE-GRSS develops training and education activities:

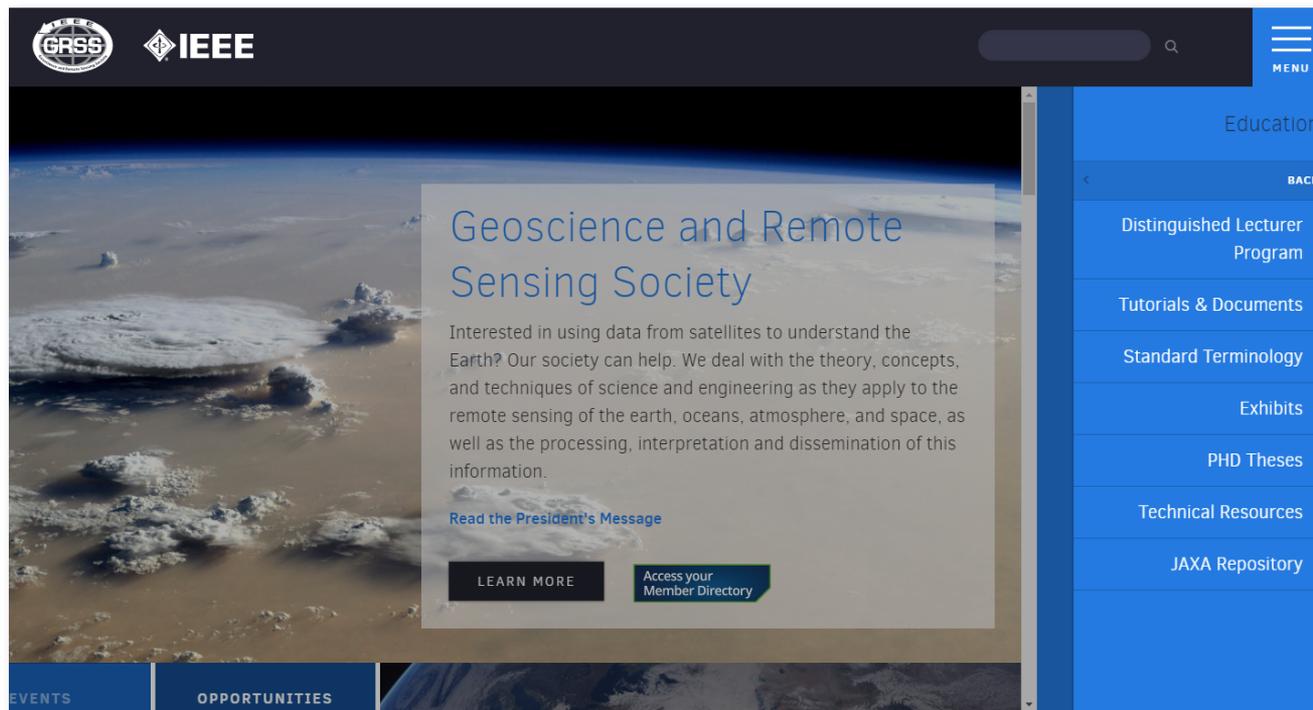
- At different **levels**: kids, graduate, post-graduate & professional
- At different **scales**: local & international
- With different **thematic**: scientific, technical & societal

Activities:

- **Distinguished Lecturer Program**
- **Tutorials & documents** at national & international conferences
- **Training material repository** (IEEE-GRSS Website)
- **Cool videos for kids**
- **Online tutorials & seminars**
- **IEEE-GRSS Society Resource Center**
 - <http://resourcecenter.grss.ieee.org/>
- **Code Library & IEEE Data Port**
 - Code Library: <http://rscl-grss.org/about.php>
 - IEEE Data Port: <https://iee-dataport.org/topic-tags/geoscience-and-remote-sensing>
- **Webinars & MOOCs**

IEEE-GRSS Education Website

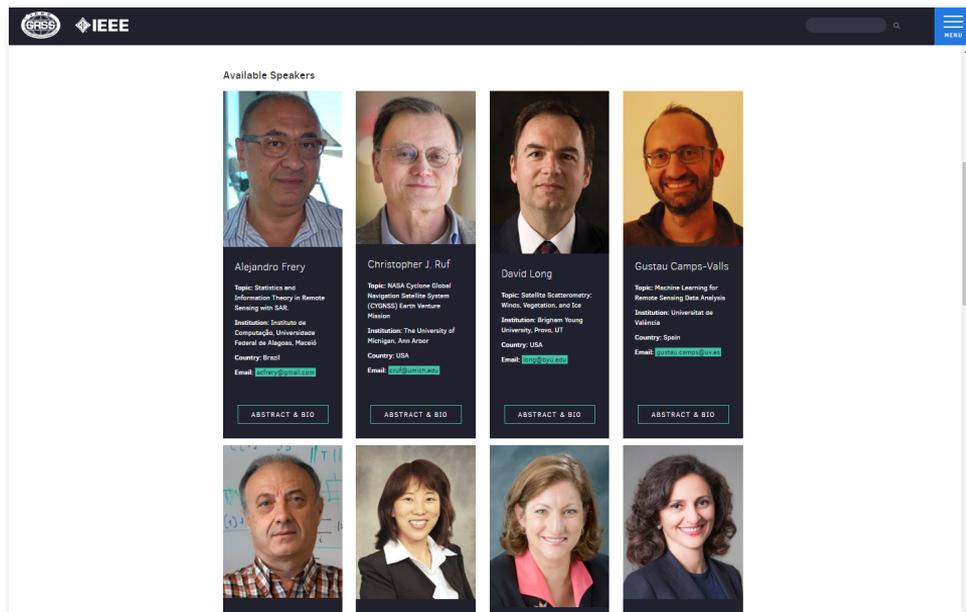
<http://www.grss-ieee.org/> > Menu > Education



The screenshot shows the IEEE-GRSS Education Website interface. At the top, there is a dark navigation bar with the IEEE GRSS and IEEE logos on the left, a search bar in the center, and a menu icon on the right. Below the navigation bar is a large banner image of Earth from space. Overlaid on the banner is a white box with the text "Geoscience and Remote Sensing Society" and a paragraph of introductory text. Below the text are two buttons: "LEARN MORE" and "Access your Member Directory". On the right side of the page, there is a blue sidebar menu with the following items: "Education", "BACK", "Distinguished Lecturer Program", "Tutorials & Documents", "Standard Terminology", "Exhibits", "PHD Theses", "Technical Resources", and "JAXA Repository". At the bottom of the page, there is a dark blue footer with the words "EVENTS" and "OPPORTUNITIES" in white capital letters.

Distinguished Lecturer Program

The **Distinguished Lecturer program** is a service of the Geoscience and Remote Sensing Society and its members to support our chapter activities. Our goal is provide chapters with access to leading professionals in our discipline



The screenshot shows a web interface for the Distinguished Lecturer Program. At the top, there are logos for GRSS and IEEE. Below the navigation bar, the text "Available Speakers" is displayed. The main content area features a grid of speaker profiles. Each profile includes a portrait photo, the speaker's name, a topic, their institution, country, and email address. At the bottom of each profile is a button labeled "ABSTRACT & BIO".

Speaker Name	Topic	Institution	Country	Email
Alejandro Frery	Topic: Statistics and Information Theory in Remote Sensing with SAR	Institution: Instituto de Computação, Universidade Federal de Alagoas, Maceió	Country: Brazil	Email: alejandrofrery@ufal.br
Christopher J. Ruf	Topic: NASA Cyclone Global Navigation Satellite System (CYGNSS) Earth Venture Mission	Institution: The University of Michigan, Ann Arbor	Country: USA	Email: cruf@umich.edu
David Long	Topic: Satellite Scatterometry: Winds, Vegetation, and Ice	Institution: Brigham Young University, Provo, UT	Country: USA	Email: david@byu.edu
Gustau Camps-Valls	Topic: Machine Learning for Remote Sensing Data Analysis	Institution: Universitat de València	Country: Spain	Email: gustau.camps@uv.es
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Tutorials & Documents

Diverse collection of education and training material (presentations, videos, etc...). Most of the material is in **English**, but some contributions are also in **Spanish**. Some examples are:

- Introduction to Lidar, Radar, Sonar
- Entire SAR curriculum from DLR
- Canada Center for Remote Sensing: Radar Polarimetry Tutorial
- “SAR Polarimetry: Basics, Processing Techniques and Applications,” Pottier, E., and L. Ferro-Famil (IGARSS 2008)
- “Radar Interferometry,” Paul Rosen (IGARSS 2004)
- ...

Remote Sensing Tutorial In **Spanish**, **French**, **Portuguese**, and **English**, associated to the TELECAN project:

- <http://www.grss-ieee.org/tutorials-documents/remote-sensing-tutorial-in-spanish-french-portuguese-and-english/>

Cool Videos for Kids

10 videos introducing Remote Sensing to kids in **English, Spanish & Chinese**.
At the end of November 2018 also in **French, Italian, German and Portuguese**

The screenshot shows the IEEE-GRSS website interface. At the top, there are logos for GRSS and IEEE, a search bar, and a 'MENU' button. Below the navigation bar, the page is titled 'Introduction to Remote Sensing' and lists 10 video topics, each with three thumbnail options in different languages:

- 1. How to observe the Earth from space
 - How to observe the Earth from Space (English)
 - Cómo observar la Tierra desde el espacio (Spanish)
 - 如何从地球看太空 (Chinese)
- 2. Remote Sensors
 - Remote sensors (English)
 - Sensores remotos (Spanish)
 - 遥感器 (Chinese)
- 3. Passive Remote Sensors
 - Passive remote sensors (English)
 - Sensores remotos pasivos (Spanish)
 - 无源遥感器 (Chinese)
- 4. Active Remote Sensors
 - Active remote sensors (English)
 - Sensores remotos activos (Spanish)
 - 有源遥感器 (Chinese)
- 5. Understanding Platforms and Orbits
 - Understanding platforms and orbits (English)
 - Comprendiendo plataformas y órbitas (Spanish)
 - 了解平台和轨道 (Chinese)
- 6. Land Remote Sensing
 - Land Remote Sensing (English)
 - Teledetección terrestre (Spanish)
 - 陆地遥感 (Chinese)
- 7. Oceans Remote Sensing
 - Oceans Remote Sensing (English)
 - Teledetección Oceanica (Spanish)
 - 海洋遥感 (Chinese)
- 8. Atmosphere and Ionosphere Remote Sensing

On the right side of the page, there is a 'JOIN GRSS' button and a 'Recent News' section with several news items, including 'AdCom Election Results', 'Silicon Valley is Investing \$19 million in space radar', and 'NASA Hires Maxar to Study Manufacturing in Space'.



Online Remote Sensing Tutorial - Introduction

- Online 10h course recorded in **English & Spanish** (GRSS Mem. necessary)
- http://www.grss-ieee.org/wp-content/uploads/2015/05/jurse2015_tutorials/media/

- Introduction to Remote Sensing (A. Broquetas)
- Earth Observation Tools (J. Cobera)
- Radar and SAR Principles (J. Malloqui)
- Synthetic Aperture Radar: Applications (C. López-Martínez)
- Microwave Radiometers: Principles, Technologies and Sensors (A. Camps)
- Microwave Radiometers: Applications (incl. SMOS-SM, SM @ 1 km, OS) (M. Piles)
- Multi- and Hyperspectral Sensors: Principles, Technologies and Sensors (L. Pipia)
- Multi- and Hyperspectral Sensors: Applications (A. Plaza)
- LIDAR: Principles, Technologies and Sensors (F. Rocadenbosh)
- LIDAR: Applications (M. Sicard)

IEEE Geoscience and Remote Sensing Society

Remote Sensing Training Materials
Materiales de Capacitación de Teledetección

Lesson Title Título de la lección	Instructor Instructor	Duration Duración	English Inglés	Spanish Español
1. Introduction to Remote Sensing	Toni Broquetas	1h 19m		
2. Earth Observation Tools (GIS, Classification...)	Jordi Cobera	0h 58m		
3. Radar and SAR Principles	Jordi Malloqui	0h 46m		
4. Synthetic Aperture Radar Applications (INSAR, PolSAR, PolInSAR, Multi-temporal, multi-frequency)	Carlos López-Martínez	0h 45m		
5. Microwave Radiometers: Principles, Technologies and Sensors	Adriano Camps	1h 20m		

Online Remote Sensing Tutorial - Applications

- Online 8h course recorded in **English & Spanish** (GRSS Mem. necessary)
- http://www.grss-ieee.org/wp-content/uploads/2015/05/more_tutorials_2016/media/

- Agriculture Applications of Synthetic Aperture Radar (J. M. López-Sánchez)
- Statistical Modelling, Processing and Analysis of SAR Images (A. Frery, L. Gómez-Deniz, R. Ospina)
- Remote Sensing Using GNSS (reflected) Signals of Opportunity (A. Camps)
- Electromagnetic Scattering in Earth Remote Sensing: the "machine code approach" (J.L. Álvarez-Pérez)
- Thermal Infrared Remote Sensing: Principles and Applications (J.C. Jimenez, J.A. Sobrino, R Niclos, V. Caselles)
- Water Quality Monitoring with Optical Methods (A. Ruiz-Verdú)
- Machine Learning for Remote Sensing Data Analysis (D. Tuia, G. Camps-Valls)
- Real-Time Hyperspectral Imaging (S. López)

IEEE Geoscience and Remote Sensing Society

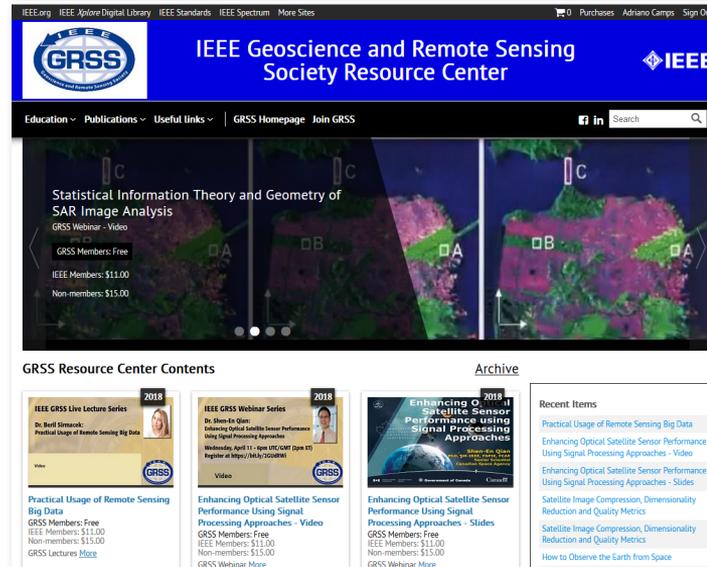
Remote Sensing Training Materials
Materiales de Capacitación de Teledetección

Disc 2

Lesson Title Título de la lección	Instructor Instructor	Duration Duración	English Inglés	Spanish Español
1. Agriculture Applications of Synthetic Aperture Radar	Juan M. López-Sánchez	0h 48m	 English	 Spanish
2. Statistical Modeling, Processing and Analysis of SAR Images	Alejandro C. Frery, Luis Gómez-Deniz, Raydonal Ospina	0h 48m	 English	 Spanish
3. Remote Sensing Using GNSS (reflected) Signals of Opportunity	Adriano Camps	1h 13m	 English	 Spanish
4. Electromagnetic Scattering in Earth Remote Sensing: the "machine code approach"	José Luis Álvarez-Pérez	0h 55m	 English	 Spanish
5. Thermal Infrared Remote Sensing: Principles and Applications	Juan C. Jiménez-Muñoz, José Antonio Sobrino, Raquel Niclos, Vicente Caselles	1h 08m	 English	 Spanish

IEEE-GRSS Society Resource Centre

- **Webinars series started:** Good mix of academia and industry
- **New Resource Centre:** <http://resourcecenter.grss.ieee.org/>
- **MOOCs** under creation in collaboration with UNSW (University of New South Whales)



IEEE.org | IEEE | Xplore Digital Library | IEEE Standards | IEEE Spectrum | More Sites

IEEE Geoscience and Remote Sensing Society Resource Center

Education | Publications | Useful links | GRSS Homepage | Join GRSS

Statistical Information Theory and Geometry of SAR Image Analysis
GRSS Webinar - Video
GRSS Members: Free
IEEE Members: \$11.00
Non-members: \$15.00

GRSS Resource Center Contents

Archive

Recent Items

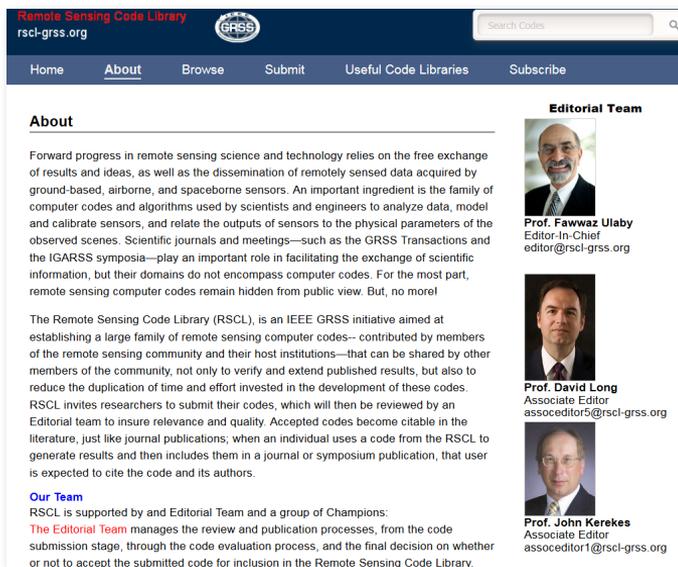
- Practical Usage of Remote Sensing Big Data
- Enhancing Optical Satellite Sensor Performance Using Signal Processing Approaches - Video
- Enhancing Optical Satellite Sensor Performance Using Signal Processing Approaches - Slides
- Satellite Image Compression, Dimensionality Reduction and Quality Metrics
- Satellite Image Compression, Dimensionality Reduction and Quality Metrics
- How to Observe the Earth from Space

Reproducible Research

- Publications repositories for **code & data**. They have also **educational value**

Remote Sensing Code Library

<http://rscl-grss.org/about.php>



Remote Sensing Code Library
rscl-grss.org

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About

Forward progress in remote sensing science and technology relies on the free exchange of results and ideas, as well as the dissemination of remotely sensed data acquired by ground-based, airborne, and spaceborne sensors. An important ingredient is the family of computer codes and algorithms used by scientists and engineers to analyze data, model and calibrate sensors, and relate the outputs of sensors to the physical parameters of the observed scenes. Scientific journals and meetings—such as the GRSS Transactions and the IGARSS symposia—play an important role in facilitating the exchange of scientific information, but their domains do not encompass computer codes. For the most part, remote sensing computer codes remain hidden from public view. But, no more!

The Remote Sensing Code Library (RSCL), is an IEEE GRSS initiative aimed at establishing a large family of remote sensing computer codes—contributed by members of the remote sensing community and their host institutions—that can be shared by other members of the community, not only to verify and extend published results, but also to reduce the duplication of time and effort invested in the development of these codes. RSCL invites researchers to submit their codes, which will then be reviewed by an Editorial team to insure relevance and quality. Accepted codes become citable in the literature, just like journal publications; when an individual uses a code from the RSCL to generate results and then includes them in a journal or symposium publication, that user is expected to cite the code and its authors.

Our Team

RSCL is supported by and Editorial Team and a group of Champions:
The **Editorial Team** manages the review and publication processes, from the code submission stage, through the code evaluation process, and the final decision on whether or not to accept the submitted code for inclusion in the Remote Sensing Code Library.

Editorial Team

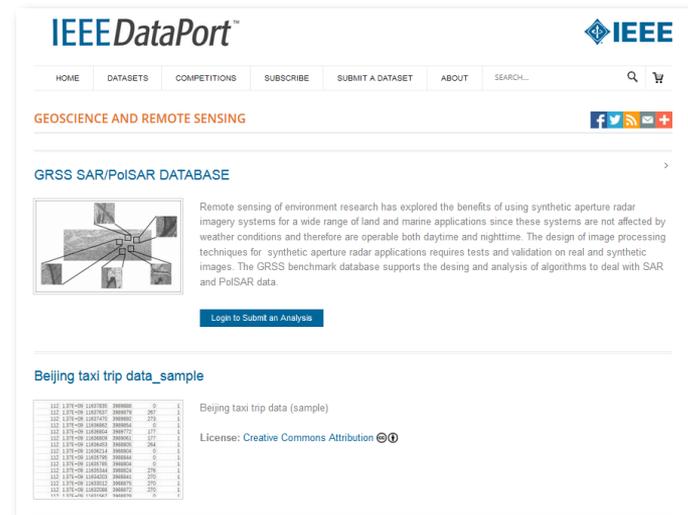
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IEEE Data Port: stand alone data or supporting data for journal articles

<https://ieee-dataport.org/topic-tags/geoscience-and-remote-sensing>



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GEOSCIENCE AND REMOTE SENSING

GRSS SAR/PoISAR DATABASE

Remote sensing of environment research has explored the benefits of using synthetic aperture radar imagery systems for a wide range of land and marine applications since these systems are not affected by weather conditions and therefore are operable both daytime and nighttime. The design of image processing techniques for synthetic aperture radar applications requires tests and validation on real and synthetic images. The GRSS benchmark database supports the design and analysis of algorithms to deal with SAR and PoISAR data.

Login to Submit an Analysis

Beijing taxi trip data_sample

Beijing taxi trip data (sample)

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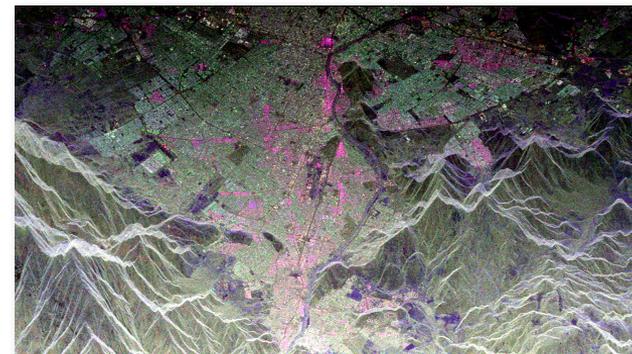
IEEE-GRSS has conducted **training efforts in South America**

- **9/2018**: Spring Remote Sensing School
- **2016/2017/2018**: IEEE-GRSS Young Professionals & ISPRS Summer School
- **11/2016**: Joint GRSS/CIREN Workshop
- **09/2016**: IEEE-GRSS Argentinian Chapter Spring School
- **10/2015**: IEEE-GRSS Young Professionals & ISPRS Summer School
- **10/2015**: Joint GRSS/CIREN Workshop
- **10/2015**: GRSS/CONAE Course and meeting
- **11/2014**: GRSS/CONAE Course and meeting. IEEE GRSS Latin America working group initiative
- **10/2010**: LARS 2010 Latin American Remote Sensing Week. IEEE GRSS Latin America working group initiative

October 2010

LARS 2010 Latin American Remote Sensing Week. IEEE GRSS Latin America working group initiative

- Title: SAR Polarimetry: Theory and Applications
- 1 week course, Santiago de Chile, Chile
- Lecturer: Carlos López-Martínez
- Tutorial taught in **Spanish**
- About **20** students
- **Contents of the course**
 - Introduction
 - Synthetic Aperture Radar Principles
 - Theory of Radar Polarimetry
 - SAR Data Statistical Description
 - Polarimetric Decompositions
 - Information vs. Frequency
 - Polarimetric SAR Interferometry
 - Applications
 - One complete day of **practice** based on the ESA-SNAP toolbox



PolSAR image of Santiago de Chile

GRSS/CONAE Course and meeting. IEEE GRSS Latin America working group initiative

- Title: Remote Sensing and its Applications
- 1 week course, Buenos Aires, Argentina
- Lecturers: Paolo Gamba, Carlos López-Martínez, Alejandro Frey
- Tutorial taught in **Spanish & English**
- About **40** students
- **Contents of the course**
 - Urban Remote Sensing
 - Hyperspectral Image Analysis
 - SAR Polarimetry
 - Change Detection
 - SAR Interferometry
 - SAR Applications
 - Statistics of Satellite Products





TRAINING ACTIVITIES IN SOUTH AMERICA

October 2015

LUXEMBOURG
INSTITUTE OF SCIENCE
AND TECHNOLOGY



GRSS/CONAE Course and meeting

- Title: Remote Sensing and its Applications
- 1 week course, Buenos Aires, Argentina
- Lecturers: Paolo Gamba, Alejandro Frery, Gianfranco Fomaro
- Tutorial taught in **Spanish & English**
- About **40** students
- **Contents of the course**
 - Machine Learning
 - Differential SAR Interferometry
 - Data Fusion
 - SAR Tomography
 - Digital Elevation Models



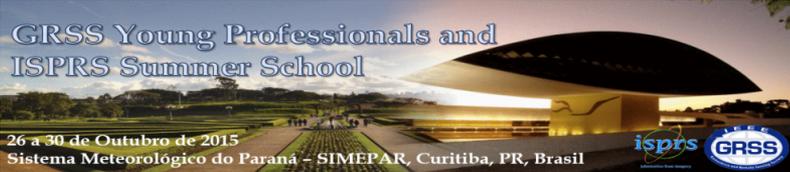
Joint GRSS/CIREN Workshop

- Title: Remote Sensing and its Applications
- 1 week course, Santiago de Chile, Chile
- Lecturers: Marcelo Scavuzzo, Carlos López-Martínez
- Tutorial taught in **Spanish**
- About **20** students
- **Contents of the course**
 - SAR Basics
 - SAR Polarimetry
 - Remote Sensing in Epidemiology
 - Remote Sensing in Disasters
 - SAR Applications
 - Risk Systems Based in Space Information

October 2015

IEEE-GRSS Young Professionals & ISPRS Summer School

- 1 week course, Curitiba, Brazil
- Tutorial taught in **English**
- About **70** students
- **Contents of the course**
 - 10 talks
 - Industrial & academic topics and speakers



GRSS Young Professionals and ISPRS Summer School
 26 a 30 de Outubro de 2015
 Sistema Meteorológico do Paraná – SIMEPAR, Curitiba, PR, Brasil

isprs GRSS

GRSS YP & ISPRS SS 2015	
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PROGRAMA PRELIMINAR

ORGANIZAÇÃO




YOUNG PROFESSIONALS

Programação	Segunda-Feira
08:00 - 09:30	Registro
09:30 - 10:00	Seção de Abertura
10:00 - 10:45	Indústria / Serviços I Assunto: A tecnologia e mercado do uso de imagens orbitais no Brasil Palestrante: Laurent Martin Soluções em imagens de satélite e softwares (ENGESAT)
10:45 - 11:00	Perguntas e Respostas
11:00 - 11:45	Indústria / Serviços II Assunto: O passado, presente e o futuro do mercado de aerolevantamento no Brasil Palestrante: Renato Asinelli Filho Associação Nacional de Empresas de Aerolevantamento



IEEE-GRSS Argentinian Chapter Spring School

- Title: Remote Sensing and its Applications
- 1 week course, Córdoba, Argentina
- Lecturers: Paolo Gamba, Claudia Notarnicola, Luis Gómez Chova
- Tutorial taught in **Spanish & English**
- About **20** students
- **Contents of the course**
 - Data Fusion
 - Advanced Classification Techniques in Remote Sensing
 - Spectral-Spatial-Based Classification
 - Retrieval of Biophysical Parameters from Remotely Sensed Imagery
 - Optical Remote Sensing Image Processing
 - Machine Learning in Remote Sensing



Joint GRSS/CIREN Workshop

- Title: Introduction to SAR Systems and their Applications
- 1 week course, Santiago de Chile, Chile
- Lecturers: Pedro Muñoz, Felipe Albornoz, Carlos López-Martínez
- Tutorial taught in **Spanish**
- About **20** students
- **Contents of the course**
 - SAR Systems Introduction
 - Basic Processing of SAR Data
 - SAR Data Applications
 - SAR Interferometry
 - SAR Polarimetry



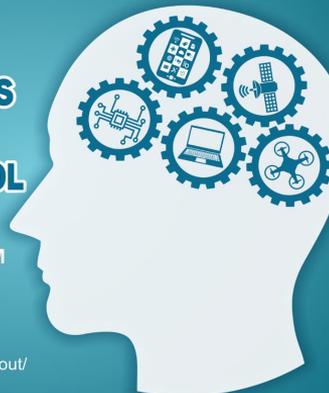
IEEE-GRSS Young Professionals & ISPRS Summer School

- Brazil
- Tutorials taught in **English**



**FEDERAL UNIVERSITY OF MATO GROSSO DO SUL
CAMPO GRANDE/MS. BRAZIL**

**GRSS YOUNG
PROFESSIONALS
AND ISPRS SC
SUMMER SCHOOL**



**MULTIUSO AUDITORIUM
OCTOBER 29
TO NOVEMBER 1, 2018**

<https://grss-isprs.ufms.br/en/about/>

Important Dates
Abstract submission: up to July 31 th, 2018 / Result of Abstract evaluation: August 31 th, 2018



Spring Remote Sensing School



- Title : The SAR Radar as a Tool for Environment Monitoring and Production
- 2 weeks courses in Córdoba, Argentina
- Tutorial taught in **Spanish & English**
- About **100** students (Scientists & stakeholders)

<https://sites.google.com/ig.edu.ar/3er-escola-de-primavera/home>





TRAINING ACTIVITIES IN SOUTH AMERICA

September 2018

LUXEMBOURG
INSTITUTE OF SCIENCE
AND TECHNOLOGY



Course content

- **Theory** lectures
- One complete day of **practice** based on the ESA-SNAP toolbox
- One day for **specific problems** discussion with lecturers/specialists

HORA / DÍA	LUNES 10/09	MARTES 11/09	MIÉRCOLES 12/09	JUEVES 13/09	VIERNES 14/09	SABADO 15/09	HORA / DÍA	LUNES 17/09	MARTES 18/09	MIÉRCOLES 19/09	JUEVES 20/09	VIERNES 21/09		
09:00-10:00							09:00-09:45	"Principles of Operation and Land Applications" Dr. A. Camps (Ple. IEEE-GRSS)	"Aplicaciones InSAR en Argentina" Dr. P. Eulitades (CEDIAC/CONICET, Argentina)	"PolSAR image classification using reaction-diffusion systems" Dr. L. Gómez Deniz (CTIM, España)	"SAR applications in Marine Meteorology" Dr. Xiaofeng Li	"Talleres de elaboración de conclusiones" Dr. L. Gómez Deniz, Dr. A. Frey, Dr. C. Scavazzo, Dr. A. Bhattacharya, Dr. Xiaofeng Li, Dr. A. Ferral, Mgter. R. Solorza		
10:00-10:30		Fundamentos de SAR 1: "El radar SAR, adquisición, Geometría, focalización, distorsiones" Dra. C. Notarnicola, (EURAC, Italia)	"Generando información a partir de imágenes SAR" Dra. C. Notarnicola	"Monitoreo de Humedades a partir de imágenes SAR" Dra. N. Morandeira (UNSAM/CONICET, Argentina)	PRÁCTICO 1: "Descarga y procesamientos de imágenes SAR" Dra. C. Notarnicola, Dra. N. Morandeira, Colaborar: Mgter. R. Solorza, (SAGCOM/CONAE, Argentina) Mgter. A. Brasca, (IG/CONAE, Argentina)	"Aplicaciones de datos SAR Polarimétricas" Dr. López Martínez	09:45-10:30	"Characterizing groundwater induced land subsidence and uplift InSAR analysis" Dra. F. Cigna	"Geometric Methods for analysis of multi-temporal and multi-polarized SAR images" Dr. A. Bhattacharya				11:00-12:00	"Statistics for SAR image analysis" Dr. A. Frey, (Univ. Alagoas, Brasil)
10:30-11:00 Coffee Break	Trámites Administrativos						10:30-11:00 Coffee Break							
11:00-12:30							11:00-12:00	"Alcances y aplicaciones de Radares Meteorológicos" Dr. A. Rodríguez, (FEEF/UNUC, Argentina) Dr. G. Caranti, (FAMAF/UNC, Argentina)	"How to be lucky publishing" Dr. A. Frey	"InSAR paso a paso" Dr. L. Eulitades				
12:30-13:30 Almuerzo							12:30-12:30 Almuerzo							
14:00-15:00	ACTO DE APERTURA: Presentación de las actividades y instituciones participantes.						13:00-14:00	"Polarimetric SAR image analysis" Dr. A. Bhattacharya, (IIT, India)	"Talleres de discusión de problemáticas con participantes" Dr. L. Gómez Deniz, Dr. A. Frey, Dr. C. Scavazzo, Dr. A. Bhattacharya, Dr. Xiaofeng Li, Dr. A. Ferral, Mgter. R. Solorza					
15:30-16:00 Coffee Break		Fundamentos de SAR 2: "La imagen SAR, Ruído, Pre procesamiento, productos" Dra. C. Notarnicola	Fundamentos de SAR 3: "Aplicaciones SAR en Argentina" Dra. M. Salvia, (IAFEC/CONICET, Argentina)	"Conceptos básicos de SAR Polarimétrica" Dr. López Martínez, (LIST, Luxemburgo)	PRÁCTICO 2: "Clasificación de imágenes SAR" Dr. López Martínez, Dra. M. Salvia, Colaborar: Mgter. R. Solorza, Mgter. A. Brasca	"Mapping and monitoring slow-moving landslides with multitemporal satellite imagery" Dra. F. Cigna, (ASI, Italia)	15:30-16:00 Coffee Break	Talleres de discusión de problemáticas con participantes" Dra. F. Cigna, Dr. López Martínez, Dr. A. Bhattacharya, Dr. C. Scavazzo, Dr. C. Notarnicola, Dr. C. Scavazzo	"Talleres de discusión de problemáticas con participantes" Dra. F. Cigna, Dr. López Martínez, Dr. A. Bhattacharya, Dr. Eulitades, Mgter. R. Solorza					
15:00-17:00	"Misión SAGCOM y el proyecto SIASGE II" Dra. L. Frulla (Inv. Principal de la Misión SAGCOM, Argentina)						14:00-17:00							



National Lecturers

- Dra. Laura Frulla (CABA) – SAOCOM PI
- Dr. Pablo Eulliades (Mendoza) - CONICET
- Dr. Marc. Thibeaut (CABA) - CONAE
- Dra. Mercedes Salvia (CABA) - CONICET
- Dra. Natalia Morandeira (CABA) - CONICET
- Dr. Pablo Eulliades (Mendoza) - CONICET
- Dr. Jorge Marquez (Mar del Plata) – IEEE-GRSS Chapter President

International Lecturers

- Dr. Alejandro Frery (Brasil)
- Dra. Claudia Notarnicola (Italy)
- Dr. Luis Gómez Déniz (Spain)
- Dr. Xiaofeng Li (China)
- Dr. Avik Bhattacharya (India)
- Carlos López Martínez (Luxembourg)
- Dr. Francesca Cigna (Italy)





TRAINING ACTIVITIES IN SOUTH-AMERICA

September 2018



Students background

- Forest fires and degradation
- Agricultural and forestry production
- Meteorology
- Wetlands
- Bioindicators
- Biomass
- Satellite phenology
- Disaster risk
- Hydrographic basins
- Cryosphere
- Hydrocarbon monitoring
- Interferometry
- SAR product validation

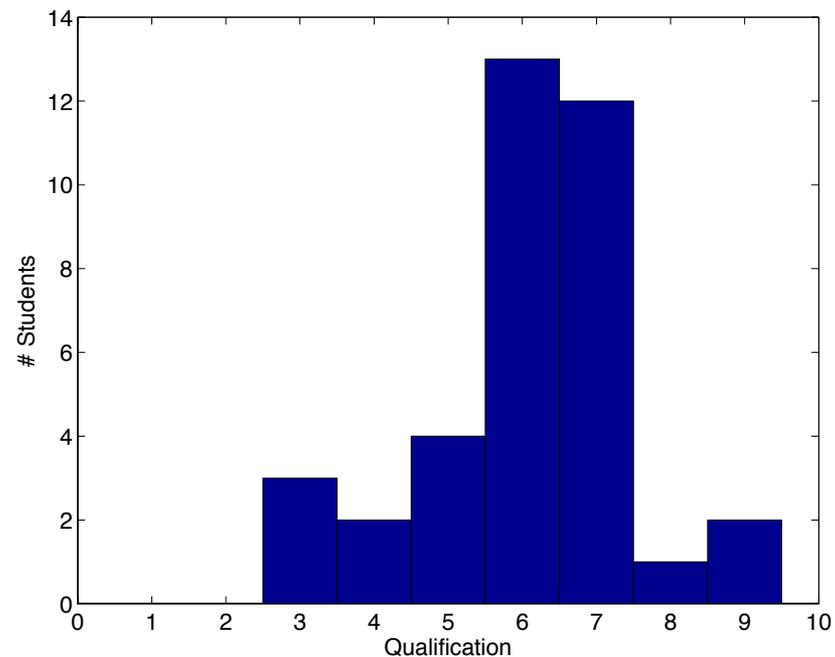
Students Origin

- Paraguay
- Cuba
- Brazil
- Mexico
- Venezuela
- Ecuador
- Argentina
- Chile
- Colombia Guatemala
- Uruguay
- Peru
- Bolivia
- Nigeria



September 2018

- **Feedback** is important, but **evaluation** may give a different picture
- Evaluation on student bases on a questionnaire of **27 single-answer** questions
- Each responsible/lecturer provided **3 questions**
- **Qualifications** (0 to 10) based on 37 answers



September 2018 - Feedback

- The format & planning adopted for the workshop has opened a space for **exchange and discussion of specific interests related to main topics**. New problems that can be approached with SAR technology were found
- The participants of the School emphasized that they acquired a new vision that allows them to **improve their practices in:**
 - Education – teaching
 - Research
 - Development & Innovation



TRAINING ACTIVITIES IN SOUTH AMERICA

LUXEMBOURG
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September 2018 - Feedback

- To **continue** these types of events throughout the region
- To **generate documents** and **online content** with material about the courses (texts, slides, data, code), as well as articles from participants' presentations
- To create a **web page** and a data repository with the memory of the Schools, containing audiovisual material, participant's opinion and their contacts
- To produce **webinars** and to be able to transmit them on YouTube
- To **share information** for the continuity of the research, training and development of applications generated in the Schools
- To **keep updated** this **information**
- To create a **network of participants** and **institutions**, such as the Cyted Network - Ibero-American Program of Science and Technology for Development
- To explore **funding opportunities**
- To **increase lab hours** and **practical activities** in upcoming events
- To structure **presentations by specialists** as poster sessions





TRAINING ACTIVITIES IN SOUTH AMERICA

Conclusions & Learnt Lessons

- Despite proficiency in **English**, **Spanish** is largely preferred
- **Cost** is an issue for registration, material & software. Participants in all the courses have indicated they only use **free-access material**
- **Basics of remote sensing** are **present**, specially in the **optical domain**. Knowledge about microwave and **Synthetic Aperture Radar** systems is **largely missing**. Nevertheless, there is a clear interest in this technology
 - Need of introduction to **electromagnetism** (λ) & **basic maths** (complex number)
- **Training must be adapted to their needs** respect to:
 - **Training level**
 - **Applications**. They have different types of applications and needs
- Courses/Tutorial should be **organized jointly with local entities**
- There are **emerging** or **stablished research groups** in Basil, Argentina and in a lower extend Chile
- South American countries have **different cultures** and “**ways of doing things**”



QUESTIONS?

— **Carlos Lopez-Martinez**

**Remote Sensing & Natural Resources Modelling Group
Luxembourg Institute of Science & Technology – LIST**

carlos.lopez@list.lu