



## The 2017 ISPRS International Workshop on Advances in SAR:

### Constellations, Signal processing, and Applications

(SarCon 2017)

#### Preliminary Schedule

Sept 20-22, 2017, during ISPRS Geospatial Week 2017

Wuhan, Hubei, China

Website: <http://insar.lmars.whu.edu.cn/sarcon2017/>

The key importance of radar remote sensing for civil applications has been recognized for decades, and enormous scientific and technical developments have been carried out to further improve the SAR sensors and SAR data processing. In recent years, SAR satellite constellations consisting of two or more satellites are getting the “new normal” in SAR remote sensing. The present availability of the SAR sensor constellations like Cosmo SkyMed, TerraSAR-X/TanDEM-X, RADARSAT-2, and the new Copernicus sensors Sentinel-1A and 1B supply a continuous stream of imagery, offering an unprecedented amount of high quality SAR data, suitable for a variety of applications provided proper data processing methodology are applied.

Future concepts, like a geosynchronous SAR or the use of non-traditional orbits for fast revisiting times over areas of interest are also important concepts for the future development of SAR remote sensing. Therefore, this wide technological availability stimulates methodological advances and innovative concepts, and new applications are opened or the already established ones are benefiting of a sort of second life

This event will take place in Wuhan, China in 2017 during the ISPRS Geospatial Week. This ISPRS international workshop, co-organized by **ISPRS WG I/3**, **WG III/2** and **WG III/3**, will provide a dedicated scientific forum for researchers, professionals, government decision-makers and students to exchange and discuss current and state-of-the-art advances in SAR. Totally, we have 27 oral reports and 24 posters. We schedule **SIX oral sessions** and **ONE poster session**. Researchers will have the opportunity to share knowledge, exchange scientific ideas and results, and develop long-term research collaborations.

#### Organizing ISPRS Working Groups

ISPRS WG I/3: SAR and Microwave Sensing

ISPRS WG III/2: Microwave Remote Sensing

ISPRS WG III/3: SAR-based Surface Generation and Deformation Monitoring

Organizing Committee

Wuhan University, ISPRS WG I/3, WG III/2 and WG III/3



## Committee

### Chairs:

Timo Balz (WG I/3, Chair), Wuhan University, China

Batuhan Osmanoglu (WG III/2, Chair), NASA Goddard Space Flight Center, USA

Fabio Rocca, POLIMI, Italy

Uwe Sörgel (WG III/3, Chair), University Stuttgart, Germany

### Program Committee:

Mattia Crespi (WG III/3, Co-Chair), University of Rome “La Sapienza”, Italy

Michele Crosetto (WG III/3, Co-Chair), CTTC, Spain

Junichi Susaki (WG III/2, Co-Chair), Kyoto University, Japan

Zhenhong Li (WG III/2, Co-Chair), Newcastle University, UK

Mingsheng Liao, Wuhan University, China

Rafael Rosa (WG I/3, Co-Chair), Bradar Industry, Brazil

Bahram Salehi (WG III/3, Secretary), Memorial University of Newfoundland, Canada

Michael Schmitt (WG I/3, Co-Chair), Technical University Munich, Germany

Teng Wang (WG I/3, Secretary), Nanyang Technological University, Singapore

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## Session Overview

Date	Time	Contents		Chair/Co-chair	Room
Wednesday 20 <sup>th</sup> , Sept. PM	14:00-17:30	Poster Session			Room X
Dinner & Rest					
Thursday 21 <sup>st</sup> , Sept. AM	09:00-09:45	<b>Keynote Speech</b>	<b>Ubiquitous and continuous SAR imaging for natural hazards</b> <i>Fabio Rocca, POLIMI, Italy</i>	Timo Balz / Uwe Sörgel	Room 1
	09:45-10:30	SAR-01: Satellite constellations		Timo Balz / Uwe Sörgel	Room 1
	10:30-11:00	Tea Break			
	11:00-12:30	SAR-02: Surface Deformation Monitoring Using SAR		Junichi Susaki / Zhenhong Li	Room 1
Lunch					
	14:00-14:45	<b>Keynote Speech</b>	<b>Ubiquitous and continuous SAR imaging for natural Twin-L SAR: Terrain Wide-Swath Interferometric L-band SAR</b> <i>Yu Wang, IECAS, China</i>	Fabio Rocca / Mingsheng Liao	Room 1
Thursday 21 <sup>st</sup> , Sept. PM	14:45-15:30	SAR-03: Satellite constellations II		Fabio Rocca / Mingsheng Liao	Room 1
	15:30-16:00	Tea Break			
	16:00-17:30	SAR-04: SAR for archaeology and land use applications		Timo Balz / Bihong Fu	Room 1
Dinner & Rest					

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Friday 22 <sup>nd</sup> , Sept. AM	09:00-09:45	<b>Keynote Speech</b>	<b>Recent advances in very high resolution multi-dimensional SAR imaging</b> <i>Xiaoxiang Zhu, Technical University Munich, Germany</i>		Room 1
	09:45-10:30	<b>SAR-05: GBSAR</b>		Michele Crosetto / Stefano Tebaldini	Room 1
	10:30-11:00	Tea Break			
	11:00-12:30	<b>SAR-06: Advanced Algorithms and Big Data Processing</b>		Uwe Sörgel / Mattia Crespi	Room 1

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<b>SAR-01: Satellite constellations</b>	
Chair: Timo Balz / Co-chair: Uwe Sörgel <span style="float: right;">Room: Room 1</span>	
09:00-10:30, Thursday, 21 <sup>st</sup> , Sept.	<b>Keynote Title:</b> Ubiquitous and continuous SAR imaging for natural hazards <i>Fabio Rocca, POLIMI, Italy</i>
	<b>Title:</b> Success in Chinese Radar Mission: First interferograms from Gaofen-3 <b>Authors:</b> Qingjun Zhang (China Academy of Space Technology, Beijing Institute of Space System Engineering), Zhenhong Li, Jiajun Chen and Yadong Liu.
	<b>Title:</b> Prototype Processors for Bistatic SAR Mission Concepts Based on Companion Satellites <b>Authors:</b> Giosue Andrey Giardino (sarmap), Paolo Pasquali and Achille Peternier.
	<b>Title:</b> Error Estimation and Unambiguous Reconstruction for Chinese First Dual-channel Spaceborne SAR Imaging <b>Authors:</b> Tingting Jin (University of Chinese Academy of Sciences), Xiaolan Qiu, Donghui Hu and Chibiao Ding
	<b>Title:</b> PARSIFAL: Passive-Active Radar Spaceborne Imaging for Applications at L-Band <b>Authors:</b> Stefano Tebaldini (POLIMI)

<b>SAR-02: Surface Deformation Monitoring Using SAR</b>	
Chair: Junichi Susaki / Co-chair: Zhenhong Li <span style="float: right;">Room: Room 1</span>	
11:00-12:30, Thursday, 21 <sup>st</sup> , Sept.	<b>Title:</b> Monitoring and Evaluation of a Long-Span Railway Bridge Using Sentinel-1 Data <b>Authors:</b> Qihuan Huang (Hohai University), Michele Crosetto, Oriol Monserrat, Bruno Crippa
	<b>Title:</b> Monitoring landslide activity of open-pit mine using Sentinel-1 TOPS time series interferometry <b>Authors:</b> Liming He (Northeastern University), Lixin Wu and Shanjun Liu.
	<b>Title:</b> Mapping Surface Deformation in a Part of the Three Gorges Reservoir Area <b>Authors:</b> Jinghui Fan (China Aero Geophysical Survey and Remote Sensing Center for Land and Resources), Hongli Zhao, Yunpeng Yan, Hongzhou Li, Ruyi Wang, Guang Liu and Pengfei Tu.
	<b>Title:</b> InSAR atmospheric correction: The Iterative Tropospheric Decomposition (ITD) based generic model <b>Authors:</b> Zhenhong Li (Newcastle University), Chen Yu, Paola Crippa and Nigel Penna.
	<b>Title:</b> An adaptive offset tracking method with SAR images for landslide displacement monitoring <b>Authors:</b> Jiehua Cai (Central South University) and Changcheng Wang.
<b>Title:</b> Estimation of phase delay due to precipitable water for DInSAR-based land deformation monitoring <b>Authors:</b> Junichi Susaki (Kyoto University), Naoya Maeda and Shin Akatsuka.	

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### SAR-03: Satellite constellations II

Chair: Fabio Rocca / Co-chair: Mingsheng Liao

Room: Room 1

14:00-15:30, Thursday, 21 <sup>st</sup> , Sept.	<p><b>Keynote Title:</b> Ubiquitous and continuous SAR imaging for natural Twin-L SAR: Terrain Wide-Swath Interferometric L-band SAR <i>Yu Wang, IECAS, China</i></p>
	<p><b>Title:</b> Concepts and Models of Lunar-based Interferometric SAR for Monitoring Macro-Scale Solid Earth's Dynamics <b>Authors:</b> Liming Jiang (State Key Laboratory of Geodesy and Earth's Dynamics, Chinese Academy of Sciences), Sidao Ni, Dewei Li, Qiang Shen and Hansheng Wang.</p>
	<p><b>Title:</b> A Novel Proposal of GF-3 Satellite Constellations for Multi-Applications <b>Authors:</b> Xiaolan Qiu (Institute of Electronics, Chinese Academy of Sciences), Chibiao Ding, Bin Lei and Fangfang Li.</p>
	<p><b>Title:</b> Urban Modelling Performance of Next Generation SAR Missions <b>Authors:</b> Umut Gunes Sefercik (Bulent Ecevit University), Naci Yastikli and Can Atalay.</p>
	<p><b>Title:</b> Application Potential Evaluation: Results from P-Band Airborne SAR Campaign <b>Authors:</b> Wei Li (Shanghai Institute of Satellite Engineering), Liying Xu and Luo Lun.</p>

### SAR-04: SAR for archaeology and land use applications

Chair: Timo Balz / Co-chair: Bihong Fu

Room: Room 1

16:00-17:30, Thursday, 21 <sup>st</sup> , Sept.	<p><b>Title:</b> Risk Monitoring and Preventive Diagnosis of Cultural Heritage Sites by Spaceborne Radar Interferometry <b>Authors:</b> Fulong Chen (RADI, CAS)</p>
	<p><b>Title:</b> Utilizing SAR ground penetration as excavation complement - Exploring a fortified settlement of the Tash-k'irman oasis, Usbekistan <b>Authors:</b> Gino Caspari (University Bern) and Timo Balz</p>
	<p><b>Title:</b> Integrated Shoreline Extraction Approach with Use of RASAT MS and Sentinel-1A SAR Images <b>Authors:</b> Nusret Demir (Akdeniz University), Selen Oy, Firat Erdem, Dursun Zafer Şeker and Bülent Bayram.</p>
	<p><b>Title:</b> Assessing land encroachments and conversion vulnerabilities of rice fields around urban areas in India using Sentinel-1 and RISAT-I data Koel Roychowdhury (Presidency University)</p>
	<p><b>Title:</b> Investigation of Lithospheric Structure in Mongolia: Insights from InSAR Observations and Modelling <b>Authors:</b> Jing Zhang (Institute of Remote Sensing and Digital Earth, Chinese Academy of Science), Bihong Fu, Pilog Shi, Qiang Guo</p>

### SAR-05: GBSAR

Chair: Michele Crosetto / Co-chair: Stefano Tebaldini

Room: Room 1

09:00-10:30, Friday, 22 <sup>nd</sup> , Sept	<p><b>Keynote Title:</b> Recent advances in very high resolution multi-dimensional SAR imaging <i>Xiaoxiang Zhu, Technical University Munich, Germany</i></p>
	<p><b>Title:</b> Data processing and analysis tools based on ground-based synthetic aperture radar imagery <b>Authors:</b> Michele Crosetto (Centre Tecnològic de Telecomunicacions de Catalunya), Oriol Monserrat, Guido Luzi, Núria Devanthéry, María Cuevas-González and Anna Barra.</p>
	<p><b>Title:</b> Development of data processing techniques for GBSAR deformation monitoring <b>Authors:</b> Zheng Wang (Newcastle University), Chris Haworth, Zhenhong Li and Jon Mills.</p>
	<p><b>Title:</b> The Monitoring Case of Ground-Based Synthetic Aperture Radar with Frequency Modulated Continuous Wave System <b>Authors:</b> Qiuping Zhai (Zhejiang Ocean University), Li Chen, Yide Dou and Yanjing Liu</p>

### SAR-06: Advanced Algorithms and Big Data Processing

Chair: Uwe Sörgel / Co-chair: Mattia Crespi

Room: Room 1

11:00-12:30, Friday, 22 <sup>nd</sup> , Sept.	<p><b>Title:</b> Copernicus Big Data and Google Earth Engine: Key Tools for Glaciers Health Monitoring <b>Authors:</b> Andrea Nascetti (University of Rome "La Sapienza"), Marco Di Tullio, Nico Emanuelli, Flavia Nocchi, Andrea Camplani and Mattia Crespi</p>
	<p><b>Title:</b> Automatic Registration for Multiview SAR Images in Urban Areas Yuming Xiang (Institute of Electronics, Chinese Academy of Sciences), Wenchao Kang and Hongjian You.</p>
	<p><b>Title:</b> G0-Wishart Distribution Based Classification from Polarimetric SAR Images <b>Authors:</b> Guangchen Hu (Liaoning Technical University) and Quanhua Zhao.</p>
	<p><b>Title:</b> Superpixel Segmentation for POLSAR Images with Local Iterative Clustering and Heterogenous Statistical Model <b>Authors:</b> Deliang Xiang (Northwest Institute of Nuclear Technology), Weiping Ni, Han Zhang, Junzheng Wu, Weidong Yan and Yi Su.</p>
	<p><b>Title:</b> Polsar Land Cover Classification Based on Hidden Polarimetric Features in Rotation Domain and SVM Classifier <b>Authors:</b> Chen-Song Tao (CEMEE NUDT), Si-Wei Chen, Yong-Zhen Li and Shun-Ping Xiao.</p>



## Poster Session

**Date: Wednesday, 20<sup>th</sup>, Sep, 14:00-17:30 PM**

**Room: Room X**

**Title:** Gaussian Mixture Model and RJMCMC Based RS Image Segmentation

**Authors:** Xue Shi (Liaoning Technical University) and Quanhua Zhao.

**Title:** Study on Land Subsidence in Cangzhou Area Based on Sentinel-1A/B images

**Authors:** Hongyue Zhou (China University of Mining and Technology), Yunjia Wang and Shiyong Yan.

**Title:** A SAR Image Registration Method Based on SIFT Algorithm

**Authors:** Wangda Lu (College of Resources and Environment, University of Chinese Academy of Sciences), Xijuan Yue and Chunming Han.

**Title:** Research on Inversion for forest height estimation using polarimetric SAR interferometry

**Authors:** Lamei Zhang (Harbin Institute of Technology), Baolong Duan, Bin Zou

**Title:** CPU-GPU accelerated Resample for InSAR time-series processing

**Authors:** Yu Yanghai (Wuhan University), Luo Heng and Timo Balz.

**Title:** High Order Moment Analysis of MSTAR Images for Automatic Target Detection

**Authors:** Ni Weiping (Northwest Institute of Nuclear Technology) and Yan Weidong.

**Title:** Forest Biomass Classification with L and P band PolInSAR Data by using SVM method

**Authors:** Han Gao (Central South University) and Changcheng Wang.

**Title:** Research on airborne SAR imaging based on ECS algorithm

**Authors:** Xiaotong Dong (Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences), Xijuan Yue, Yinghui Zhao and Chunming Han,

**Title:** Mining Land Subsidence Monitoring Using Sentinel-1 SAR Data

**Authors:** Weilin Yuan (China Aero Geophysical Survey and Remote Sensing Centre for Land and Resources), Qun Wang and Jinghui Fan

**Title:** SAR Chance Detection Based on Binary Hypothesis Test and Statistical Properties

**Authors:** Bin Cui (Wuhan University), Yonghong Zhang, Li Yan and Xuanxuan Cai.

**Title:** Monitoring Ground deformation in coastal areas with time-series sentinel-1A images: A case study in Shangyu, south coast of Hangzhou Bay

**Authors:** Yuxing Chen (State Key Laboratory of Geodesy and Earth's Dynamics, Institute of Geodesy and Geophysics, Chinese Academy of Sciences), Liming Jiang, Lin Bai and Qishi Sun.

**Title:** Urban land cover mapping using MT-InSAR covariance matrix estimation

**Authors:** Xin Tian (Southeast University), Mi Jiang, Haoping Qi and Yuxiao Ma.

**Title:** Detection of aquifer and land subsidence of Shanghai using short baseline TCPInSAR technique

**Authors:** Yanling Chen (Shanghai Astronomical Observatory, Chinese Academy of Sciences), Jicang Wu, Juan Lu and Li Zhang.

**Title:** TOPS CO-Registration Using Enhanced Spectral Diversity

**Authors:** Boulemnakher Karim (Wuhan University), Benattou Mustapha Mehdi and Timo Balz.

**Title:** A Preliminary Study on Sea Surface Salinity Retrieval in the Northwest Pacific Ocean and off-shore China

**Authors:** Ying Niu (SKLEC, ECNU) and Fang Ge

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<p><b>Title:</b> A Research on Monitoring Surface Deformation and Relationships with Surface Parameters in Qinghai Tibetan Plateau Permafrost</p> <p><b>Authors:</b> Sujuan Mi (China Transport Telecommunications &amp; Information Center), Yuanting Li, Li Li, Lun Luo, Chunlei Zhang and Jianbing Chen.</p>
<p><b>Title:</b> Understand statistics in ultra-high resolution SAR images of different categories via complex generalized Gaussian estimation</p> <p><b>Authors:</b> Wenjin Wu (RADI, CAS), Xinwu Li and Huadong Guo</p>
<p><b>Title:</b> A Fast and Novel Corner Detector for SAR Imagery</p> <p><b>Authors:</b> Niangang Jiao (Institute of Electronics, Chinese Academy of Sciences), Wenchao Kang, Yuming Xiang and Hongjian You.</p>
<p><b>Title:</b> Quality evaluation of interferometric DEMs derived from TanDEM-X data and applications in coastal vulnerability mapping</p> <p><b>Authors:</b> Peng Li (Ocean University of China) and Zhenhong Li.</p>
<p><b>Title:</b> Measuring the co-seismic displacements of 2010 Ms7.1 Yushu earthquake by using SAR and high resolution optical satellite images</p> <p><b>Authors:</b> Li Zhang (Tongji University), Jicang Wu and Feng Shi.</p>
<p><b>Title:</b> Monitoring Shie Glacier Surface Movement by Cosmo-SkyMed Images</p> <p><b>Authors:</b> Qun Wang (China University of Geosciences), Jinghui Fan, Wei Zhou, Weilin Yuan, Zhaocheng Guo and Bin Liu.</p>
<p><b>Title:</b> Regional SAR Image Segmentation Based on Fuzzy Clustering with Gamma Mixture Model</p> <p><b>Authors:</b> Xiaoli Li (School of Geomatics, Liaoning Technical University), Quanhua Zhao and Yu Li.</p>
<p><b>Title:</b> Deformation measurement using Sentinel-1A/B imagery</p> <p><b>Authors:</b> Michele Crosetto (Centre Tecnològic de Telecomunicacions de Catalunya), Oriol Monserrat, Núria Devanthery, María Cuevas-González, Anna Barra and Bruno Crippa.</p>
<p><b>Title:</b> Monitoring activity at the Daguangbao mega-landslide (China) using Sentinel-1 TOPS time series interferometry</p> <p><b>Authors:</b> Keren Dai (Chengdu University of Technology), Zhenhong Li, Roberto Tomas, Guoxiang Liu</p>