

# PROCEEDINGS OF SPIE

[SPIDigitalLibrary.org/conference-proceedings-of-spie](https://SPIDigitalLibrary.org/conference-proceedings-of-spie)

## Front Matter: Volume 10003

, "Front Matter: Volume 10003," Proc. SPIE 10003, SAR Image Analysis, Modeling, and Techniques XVI, 1000301 (28 December 2016); doi: 10.1117/12.2263509

**SPIE.**

Event: SPIE Remote Sensing, 2016, Edinburgh, United Kingdom

# PROCEEDINGS OF SPIE

## ***SAR Image Analysis, Modeling, and Techniques XVI***

**Claudia Notarnicola  
Simonetta Paloscia  
Nazzareno Pierdicca  
Edward Mitchard**  
*Editors*

**28 September 2016  
Edinburgh, United Kingdom**

*Sponsored by*  
SPIE

*Cooperating Organisations*  
Innovation Centre for Sensor and Imaging Systems (United Kingdom)  
ADS Scotland (United Kingdom)  
The Knowledge Transfer Network (United Kingdom)  
Visit Scotland (United Kingdom)  
European Regional Development Fund (Belgium)  
Technology Scotland (United Kingdom)  
European Association of Remote Sensing Companies (Belgium)  
European Association of Remote Sensing Laboratories (Germany)  
The British Association of Remote Sensing Companies (United Kingdom)  
Remote Sensing & Photogrammetry Society (United Kingdom)

*Published by*  
SPIE

**Volume 10003**

Proceedings of SPIE 0277-786X, V. 10003

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

SAR Image Analysis, Modeling, and Techniques XVI, edited by Claudia Notarnicola, Simonetta Paloscia, Nazzareno Pierdicca, Edward Mitchard, Proc. of SPIE Vol. 10003, 1000301 · © 2016 SPIE  
CCC code: 0277-786X/16/\$18 · doi: 10.1117/12.2263509

Proc. of SPIE Vol. 10003 1000301-1

The papers in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. Additional papers and presentation recordings may be available online in the SPIE Digital Library at [SPIDigitalLibrary.org](http://SPIDigitalLibrary.org).

The papers reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from these proceedings:

Author(s), "Title of Paper," in *SAR Image Analysis, Modeling, and Techniques XVI*, edited by Claudia Notarnicola, Simonetta Paloscia, Nazzareno Pierdicca, Edward Mitchard, Proceedings of SPIE Vol. 10003 (SPIE, Bellingham, WA, 2016) Seven-digit Article CID Number.

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510604100

ISBN: 9781510604117 (electronic)

Published by

**SPIE**

P.O. Box 10, Bellingham, Washington 98227-0010 USA

Telephone +1 360 676 3290 (Pacific Time) · Fax +1 360 647 1445

[SPIE.org](http://SPIE.org)

Copyright © 2016, Society of Photo-Optical Instrumentation Engineers.

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of copying fees. The Transactional Reporting Service base fee for this volume is \$18.00 per article (or portion thereof), which should be paid directly to the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923. Payment may also be made electronically through CCC Online at [copyright.com](http://copyright.com). Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher. The CCC fee code is 0277-786X/16/\$18.00.

Printed in the United States of America.

Publication of record for individual papers is online in the SPIE Digital Library.

**SPIE. DIGITAL LIBRARY**

[SPIDigitalLibrary.org](http://SPIDigitalLibrary.org)

---

**Paper Numbering:** *Proceedings of SPIE* follow an e-First publication model. A unique citation identifier (CID) number is assigned to each article at the time of publication. Utilization of CIDs allows articles to be fully citable as soon as they are published online, and connects the same identifier to all online and print versions of the publication. SPIE uses a seven-digit CID article numbering system structured as follows:

- The first five digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc. The CID Number appears on each page of the manuscript.

# Contents

- v *Authors*  
vii *Conference Committee*

---

## JOINT SESSION: SAR DATA PROCESSING II

---

- 10003 02 **Automatic GCP extraction with high resolution COSMO-SkyMed products** [10003-1]  
10003 03 **Automatic SAR/optical cross-matching for GCP monograph generation** [10003-2]  
10003 04 **Contextual descriptors and neural networks for scene analysis in VHR SAR images** [10003-3]  
10003 05 **Tropical forest heterogeneity from TanDEM-X InSAR and lidar observations in Indonesia**  
[10003-4]  
10003 06 **Detection and quantification of precipitations signatures on synthetic aperture radar  
imagery at X band** [10003-5]

---

## SESSION 1 SAR INTERFEROMETRY TECHNIQUES AND APPLICATIONS I

---

- 10003 08 **Airborne X-band SAR tomography for forest volumes** [10003-7]  
10003 09 **3D velocity field time series using synthetic aperture radar: application to tidal-timescale  
ice-flow variability in Rutford Ice Stream, West Antarctica** [10003-8]

---

## SESSION 2 SAR INTERFEROMETRY TECHNIQUES AND APPLICATIONS II

---

- 10003 0B **Comparative analysis of recent satellite missions for multi-temporal SAR interferometry**  
[10003-10]  
10003 0D **Contextual filtering method applied to sub-bands of interferometric image decomposition**  
[10003-13]

---

## SESSION 3 RETRIEVAL OF BIO-GEOPHYSICAL PARAMETERS FROM MICROWAVE DATA

---

- 10003 0H **SMOS, ASCAT, SMAP and ERA soil moisture comparison through the triple and quadruple  
collocation technique** [10003-18]

---

## POSTER SESSION

---

- 10003 0J **Spotlight COSMO-SkyMed DEM generation and validation** [10003-19]

- 10003 0K **Characterization and discrimination of evolving mineral and plant oil slicks based on L-band synthetic aperture radar (SAR)** [10003-20]
- 10003 0M **Rheticus: an automatic cloud-based geo-information service platform for territorial monitoring** [10003-22]
- 10003 0N **Structural health monitoring of engineered structures using a space-borne synthetic aperture radar multi-temporal approach: from cultural heritage sites to war zones** [10003-23]
- 10003 0Q **25 years of satellite InSAR monitoring of ground instability and coastal geohazards in the archaeological site of Capo Colonna, Italy** [10003-26]

# Authors

Numbers in the index correspond to the last two digits of the seven-digit citation identifier (CID) article numbering system used in Proceedings of SPIE. The first five digits reflect the volume number. Base 36 numbering is employed for the last two digits and indicates the order of articles within the volume. Numbers start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B...0Z, followed by 10-1Z, 20-2Z, etc.

Agram, Piyush, 09  
Agrimano, Luigi, 02, 03, 0M  
Belhadj-Aissa, M., 0D  
Belhadj-Aissa, S., 0D  
Belmonte, Antonella, 0B  
Biondi, Filippo, 0N  
Boughacha, M. S., 0D  
Bovenga, Fabio, 0B, 0M  
Brekke, Camilla, 0K  
Brigante, A., 0Q  
Burgmann, Roland, 0N  
Calcaterra, D., 0Q  
Chiaradia, Maria Teresa, 02, 03, 0M  
Cigna, Francesca, 0N, 0Q  
Confuorto, P., 0Q  
Crapolicchio, R., 0H  
De Grandi, Elsa Carla, 05  
Del Frate, Fabio, 04  
Di Martire, D., 0Q  
Espeseth, Martine M., 0K  
Falasco, Alessia, 04  
Fascetti, F., 0H  
Fielding, Eric, 0N  
Hocine, F., 0D  
Holt, Benjamin, 0K  
Ietto, F., 0Q  
Jones, Cathleen E., 0K  
La Mantia, Claudio, 02, 03  
Lombardi, N., 0J  
Lorusso, Antonio Pio, 0M  
Lorusso, R., 0J  
Lundgren, Paul, 0N  
Marzano, Frank S., 06  
Milillo, Pietro, 09, 0N  
Milillo, Giovanni, 0J, 0N  
Minchew, Brent, 09  
Mitchard, Edward, 05  
Montopoli, Mario, 06  
Morea, Alberto, 02, 03  
Mori, Saverio, 06  
Muirhead, Fiona, 08  
Mulgrew, Bernard, 08  
Nitti, Davide Oscar, 02, 03, 0M  
Novellino, A., 0Q  
Nutricato, Raffaele, 02, 03, 0M  
Pasquariello, Guido, 0B  
Perissin, Daniele, 0N  
Picchiani, Matteo, 04  
Pierdicca, Nazzareno, 06, 0H  
Plank, S., 0Q  
Pulvirenti, Luca, 06, 0H  
Ramondini, M., 0Q  
Refice, Alberto, 0B  
Riel, Bryan, 09  
Salzer, Jacqueline, 0N  
Samarelli, Sergio, 02, 03, 0M  
Schiavon, Giovanni, 04  
Serio, Carmine, 0N  
Simons, Mark, 09  
Skrunes, Stine, 0K  
Sowter, A., 0Q  
Tapete, Deodato, 0N, 0Q  
Woodhouse, Iain H., 08



# Conference Committee

## *Symposium Chair*

**Klaus Schäfer**, (*Retired*) Karlsruhe Institute of Technology, Institute of Meteorology and Climate Research (Germany)

## *Symposium Co-chairs*

**Christopher M. U. Neale**, University of Nebraska-Lincoln, Daugherty Water for Food Institute (United States)

**Iain H. Woodhouse**, The University of Edinburgh, Geography and the Lived Environment Research Institute (United Kingdom)

## *Conference Chairs*

**Claudia Notarnicola**, EURAC Research (Italy)

**Simone Paloscia**, Istituto di Fisica Applicata Nello Carrara (Italy)

**Nazzareno Pierdicca**, Università degli Studi di Roma La Sapienza (Italy)

**Edward Mitchard**, The University of Edinburgh (United Kingdom)

## *Conference Program Committee*

**Richard Bamler**, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)

**Fabio Bovenga**, CNR ISSIA (Italy)

**Fabio Covello**, Agenzia Spaziale Italiana (Italy)

**Mihai P. Datcu**, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)

**Fabio Del Frate**, Università degli Studi di Roma "Tor Vergata" (Italy)

**Dara Entekhabi**, Massachusetts Institute of Technology (United States)

**Carlos Lopez-Martinez**, Universitat Politècnica de Catalunya (Spain)

**Luca Pulvirenti**, CIMA Research Foundation (Italy)

**Emanuele Santi**, Istituto di Fisica Applicata Nello Carrara (Italy)

**Stefan Schneiderbauer**, EURAC Research (Italy)

**David Small**, University of Zürich (Switzerland)

## *Session Chairs*

Joint Session: SAR Data Processing I

**Lorenzo Bruzzone**, Università degli Studi di Trento (Italy)

Joint Session: SAR Data Processing II

**Claudia Notarnicola**, EURAC Research (Italy)



- 1 SAR Interferometry Techniques and Applications I  
**Fabio Bovenga**, CNR ISSIA (Italy)
- 2 SAR Interferometry Techniques and Applications II  
**Emanuele Santi**, Istituto di Fisica Applicata "Nello Carrara" (Italy)
- 3 Retrieval of Bio-geophysical Parameters from Microwave Data  
**Edward Mitchard**, The University of Edinburgh (United Kingdom)