



RFI 2019

Coexisting with Radio Frequency Interference

Toulouse, France
September 23-26, 2019



Technical Programme

Monday, September 23

8:00 Registration

8:30-10:45 Opening Session and Keynote Speeches

8:30-8:45 [Welcome Address](#)

8:45-9:30 Vadim Nozdrin (ITU Radiocommunication Bureau, Switzerland)
[ITU Activity for Space Science Services](#)

9:30-10:15 Stephen English (European Centre for Medium-Range Weather Forecasts, UK)
[The Value of Passive Bands Used by Microwave Instruments in Numerical Weather Prediction](#)

10:15-11:00 Gelu Nita (New Jersey Institute of Technology, USA)
[The Generalized Spectral Kurtosis Estimator: A Review of Its Statistical Properties and Applications](#)

11:00-11:25 Coffee Break

11:25-12:40 Operational RFI Mitigation – Chairs: Abraham Otto and Albert-Jan Boonstra

11:25-11:50 Alessio Sclocco, Dany Vohl, Rob van Nieuwpoort
[Real-Time RFI Mitigation for the Apertif Radio Transient System](#)

11:50-12:15 Haiyan Zhang, Hao Hu, Shijie Huang, Li Yang, Xinxin Zhang
[Satellite RFI Mitigation on FAST](#)

12:15-12:40 Jean-Michel Martin
[WIBAR Spectrometer and RFI Mitigation](#)

12:40-14:00 Lunch Break

14:00-15:40 RFI Detection and Localization – Chairs: Alexandra Bringer and Roger Oliva

- 14:00-14:25 Eric Anterrieu, Francois Cabot, Ali Khazaal
[*Almost ten years of early RFI detection/quantification with the Noise Injection Radiometers onboard MIRAS*](#)
- 14:25-14:50 Roger Oliva, Antonio Martellucci, Elena Daganzo, Stephen English, Patricia Rosnay, Jose Barbosa
[*New Concept for RFI Detection in EO Data: Ground RFI Detection Station*](#)
- 14:50-15:15 Eric Anterrieu, Francois Cabot, Ali Khazaal, Nemesio Rodriguez-Fernandez, Yann Kerr
[*A Machine Learning Approach for Sub-Kilometric Geolocation of RFI Sources from SMOS Interferometric Data*](#)
- 15:15-15:40 Niccolò Franceschi, Riccardo Piantanida, Andrea Recchia, Davide Giudici, Andrea Monti-Guarnieri, Nuno Miranda, Clément Albinet
[*RFI Monitoring and Classification in C-band Using Sentinel-1 Noise Pulses*](#)

15:40-16:00 Coffee Break

16:00-17:50 Spectrum Management – Chairs: Thomas Von Deak and Paolo de Matthaëis

- 16:00-16:35 Markus Dreis
[*Role and Responsibilities of the ITU-R Working Party 7C on Remote Sensing Systems*](#)
- 16:35-17:00 Bevin Zauderer, Jonathan Williams
[*RFI 2029: New Challenges and New Approaches for the Coming Decade*](#)
- 17:00-17:25 Elena Daganzo, Alvaro Llorente, Roger Oliva, Ekhi Uranga, Yann Kerr, Antonio De la Fuente, Philippe Richaume
[*Lessons Learnt from SMOS RFI Activities After 10 Years in Orbit: Claiming Protection and Increasing Awareness of The Interference Problems in the 1400-1427 MHz Passive Band*](#)
- 17:25-17:50 Elena Daganzo, Edoardo Marelli
[*Frequency Management for Passive Remote Sensing from an ESA Perspective*](#)

18:00-20:00 Icebreaker

Tuesday, September 24

8:30-10:10 RFI Considerations in Instrument Design – Chairs: Urvashi Rao and Federico Di Vruno

8:30-8:55 Thushara Gunaratne, Peens-Hough Peens-Hough
[Modeling of RFI and RFI Mitigation Techniques in SKA1 Mid Telescope](#)

8:55-9:20 Luke Hawkins, Ryan Lynch
[Active RFI Management at the Green Bank Observatory](#)

9:20-9:45 Alan Erickson, Urvashi Rao Venkata
[The Dimensions of RFI, and how ngVLA is Being Designed to Accommodate Them](#)

9:45-10:10 Federico Di Vruno
[RFI/EMC Management in the Square Kilometre Array Radio Telescope](#)

10:10-10:25 Poster Introduction (2 minutes per poster) – Chair: Sidharth Misra

10:25-11:00 Coffee Break

10:25-11:25 Poster Session

Timothy Robishaw, Stephen Harrison, David Del Rizzo, Robert Messing, Benoit Robert
[Bustin' Makes Me Feel Good: A Low-Cost Cell Phone Buster for the 850 MHz Band](#)

Geng Lihong, Liu Donghao, Su Cang, Li Sha, Yan Yihua, Chen Zhijun
[Complex Electromagnetic Environment and RFI Mitigation at Mingantu Observing Station](#)

M.A. Brentjens, E. van Maanen, P. Bolli, M.J. Norden, B.A. Witvliet, G. Virone, F. Paonessa, A.J. Boonstra
[Conditions for LOFAR Radio Telescope and Wind Farm Co-Existence](#)

Edward Kim, Albert Wu, Eugenia De Marco
[The NASA Goddard RF Explorer \(GREX\), an Instrument to Monitor the Interference Environment](#)

Aravind Venkitasubramony, Albin Gasiewski, Eryan Dai, Maciej Stachura, Roger Carter, Jack Elston
[RFI Detection and Mitigation in an L-Band Correlation Radiometer for sUAS Based Soil Moisture Measurements](#)

Jorge Querol, Adrián Pérez, Adriano Camps
[Real-time Radio Frequency Interference Detection and Mitigation with the Front-End GNSS Interference eXcisor \(FENIX\)](#)

11:25-12:15 Panel Discussion on Remote Sensing Issues

Moderator: Thomas von Deak

Panelists: [Markus Dreis, Chairman of ITU-R Working Party 7C](#)
[Stephen English, European Centre for Medium-Range Weather Forecasts](#)
[David Le Vine, NASA Goddard Space Flight Center](#)
[Alvaro Llorente, European Space Agency](#)

12:15-13:30 Lunch Break

13:30-17:00 AirBus Assembly Line Tour

Wednesday, September 25

8:45-10:00 RFI Impact and Monitoring – Chairs: Yann Kerr and David Le Vine

- 8:45-9:10 Sidharth Misra, Joel Johnson
Space-borne Demonstration of the CubeSat Radiometer Radio Frequency Interference Technology (CubeRRT) Validation Mission
- 9:10-9:35 Tobias Bollian, Marwan Younis, Gerhard Krieger
[Digital Beamforming Based RFI Extraction for an On-Ground Correction of Synthetic Aperture Radar Data](#)
- 9:35-10:00 Paolo de Matthaëis, David Draper, Joel Johnson, Steen Savstrup Krinstensen, Yan Soldo, Thomas von Deak, Mohammad Al-Khalidi, Rashmi Shah
[Radio Frequency Interference \(RFI\) Observed Over Water Surfaces at 18.6-18.8 GHz and the IEEE GRSS Involvement with ITU-R to Address this Issue](#)

10:00-10:30 Coffee Break

10:30-13:00 Spectrum Management – Chairs: Jean-Luc-Issler and Balthasar Indermühle

- 10:30-11:10 Tasso Tzioumis
Working Party 7D (of the ITU-R) and its Importance for the Radio Astronomy Community
- 11:10-11:35 Liese van Zee, Nathaniel Livesey, Sandra Cruz-Pol, William Emery, Namir Kassim, Amy Lovell, Mahta Moghaddam, James Moran, Scott Ransom, Gail Skofronick-Jackson, Paul Siqueira, Tomas Gergely, Darrel Emerson, Paul Feldman
[The Committee on Radio Frequencies - Protecting the Scientific Use of the Radio Spectrum](#)
- 11:35-12:00 Vadim Nozdrin
[Digital Spectrum Management](#)
- 12:00-12:25 Farzin Manshadi
[Preventing Adjacent Band Interference from Earth Exploration Satellites to Space Research \(Deep Space\) Missions](#)
- 12:25-12:50 Catherine Gabay
[GNSS Interference Cases Handling and the Fight Against the Spread of Illegal GNSS Jammers by ANFR, the French Spectrum Management and Monitoring Authority](#)

12:50-14:20 Lunch Break

14:20-16:00 New Developments in RFI Mitigation – Chairs: Greg Hellbourg and Timothy Robishaw

- 14:20-14:45 Jemma Boyle, Alessio Sclocco
[Edge-Thresholding: A New Thresholding Based Real-Time RFI Mitigation Algorithm for Transient Detection](#)
- 14:45-15:10 Yogesh Maan
[Fourier Domain Excision of Periodic RFI](#)
- 15:10-15:35 Gary J. Hovey, Federico Di Vruno
[A Framework for RFI Simulation and Performance Verification](#)
- 15:35-16:00 Gregory Hellbourg, Ian Morrison
[Cyclic Imaging for All-Sky Interference Forecasting with Array Radio Telescopes](#)

16:00-16:30 Coffee Break

16:30-17:20 Panel Discussion on Radio Astronomy Issues

- Moderator: Balthasar Indermühle
- Panelists: [Willem Baan, ASTRON](#)
[Federico Di Vruno, Square Kilometre Array](#)
[Harvey Liszt, National Radio Astronomy Observatory](#)
[Abraham Otto, University of Stellenbosch](#)
[Tasso Tzioumis, Chairman of ITU-R Working Party 7D](#)

20:00-22:30 Banquet

Thursday, September 26

9:00-10:40 Machine Learning for RFI Mitigation – Chairs: Amit Mishra and Stephen Harrison

9:00-9:25 Stephen Harrison, Rory Coles, Timothy Robshaw, David Del Rizzo
[RFI Novelty Detection using Machine Learning Techniques](#)

9:25-9:50 Harrison Kyle, Amit Mishra
[Supervised Neural Networks for RFI Flagging](#)

9:50-10:15 Alexis Louis
[Neural Networks Based EWF Detection](#)

10:15-10:40 Mao Yuan, Weiwei Zhu, Di Li, Bo Peng, Haiyan Zhang
[An Unsupervised Interference Classifier for Radio Telescope Data](#)

10:40-11:10 Coffee Break

11:10-12:50 RFI Filtering – Chairs: Ryo Natsuaki and Yan Soldo

11:10-11:35 Alexandra Bringer, Matt Daehn, Gordon Weiss, Joel Johnson
[A Time Series Method for Identifying and Removing Radio Frequency Interference \(RFI\) from Soil Moisture Active/Passive \(SMAP\) L-band radiometer data](#)

11:35-12:00 Ali Khazaal, Roger Oliva, Philippe Richaume, Ignassi Corbella, Francois Cabot, Jose Barbosa, Gonçalo Lopes, Eric Anterrieu
[Towards RFI Mitigation in SMOS Image Reconstruction Operational Processor: Impact on Retrieved Brightness Temperature and Soil Moisture](#)

12:00-12:25 Ryo Natsuaki, Pau Prats-Iraola
[Time Variant and Narrow Bandwidth RFI Detection in Multi-Receiver SAR: Preliminary Study in ALOS-2](#)

12:25-12:50 Yan Soldo, David Le Vine, Paolo de Matthaeis
[An Approach to Address Residual “Hot Spots” in SMAP RFI-filtered Data](#)

12:50 -14:20 Lunch Break

14:20-15:45 Astronomical Site Management – Chairs: Haiyan Zhang and Aaron Chippendale

14:20-14:45 Riaan Wolhuter, Abraham Otto, Jason Fynn, Johannes Havenga, Carel Van der Merwe
[A Band Comparison Investigation for RFI Emission Mitigation by a Mobile Radio Communications Network for the SKA Radio Astronomy Project](#)

14:45-15:10 Abraham Otto, Riaan Wolhuter, Jason Fynn, Johannes Havenga
[Radio Frequency Interference from an Operational Communications Networks in a Radio Astronomy Environment](#)

15:10-15:35 Qi Liu, Ye Liu, Xiao Ming Su, Feng Liu
[Shielding Engineering Progress for QTT Facilities](#)

15:35-16:00 Coffee Break

16:00-16:50 Astronomical Site Management – Chairs: Haiyan Zhang and Aaron Chippendale

16:00-16:25 Aaron Chippendale
[Modelling RFI Propagation by Diffraction to Find Radio Quiet Sites in Australia](#)

16:25-16:50 Balthasar Indermühle, Carol Wilson
Monitoring Results from the Murchison Radio-Astronomy Observatory Since 2016

16:50-17:00 Closing Remarks