



Report from the event supported by RadioNet

TITLE *IUCAF 5TH SCHOOL ON SPECTRUM MANAGEMENT FOR RADIO ASTRONOMY*

DATE: *2ND TO 6TH OF MARCH 2020*

LOCATION: *STELLENBOSCH, SOUTH AFRICA*

MEETING WEBPAGE: *<http://www.iucaf.org/sms2020/>*

HOST INSTITUTE: *SARAO/STIAS*

RADIONET BENEFICIARY / NO: *INAF*

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Report:

1 SCIENTIFIC SUMMARY

The 5th IUCAF 5th School on Spectrum Management for Radio Astronomy was held in Stellenbosch in South Africa from March 2nd to March 6th 2020. The event website is at <http://www.iucf.org/sms2020/>

1.1 SCIENTIFIC SUMMARY

Spectrum management is a task of rapidly growing importance, for radio astronomy as well as for other radio services; however, it is not part of any academic curriculum; radio astronomers have to learn it on the job. The IUCAF School in Spectrum Management was an opportunity for rising spectrum managers to profit from the experience of colleagues. The purpose being to train the next generation of Scientists, Engineers and Administrators in the skills necessary to protect the scientific use of the radio spectrum. Ever increasing availability of wireless applications (mobile phones, Wireless LANs, etc.), communication satellites and marketing of new technologies, such as ultra-wide band systems, power line telecommunication systems, cognitive radio systems and dynamic spectrum access (DSA) put pressure on the scientific use of the spectrum. The development of radio astronomy depends critically on astronomers' continued access to the radio spectrum, and this in turn demands that astronomers and particularly radio observatories pay closer attention to the technical and regulatory issues that arise in relation to managing the radio spectrum, particularly as they relate to radio astronomy.

IUCAF spectrum management schools were previously held in 2002 (Green Bank, USA), 2005 (Castel San Pietro Terme, Italy), 2010 (Mitaka, Japan) and 2014 (Santiago, Chile).

The meeting presentations are available at <https://www.atnf.csiro.au/people/Tasso.Tzioumis/sms2020/presentations/>

1.2 RADIONET RELEVANCE

Spectrum management is an important component in the successful operation of any radio astronomy facility.

1.3 IMPACT

This summer school attracted the largest number of participants to date for the IUCAF spectrum management summer school. Some of these participants are experienced spectrum managers, but the majority were not. This represents a significant transfer of knowledge to a wider group at a time when scientific use of the radio spectrum is under pressure from commercial interests.

2 AGENDA OF THE EVENT

Monday, 2 March, 2020

09:00 Introduction

Greetings from the SOC

T. Tzioumis

Welcome from the sponsors

SARAO

Adrian Tiplady (SARAO)

CRAF, RadioNet

Michael Lindqvist (Chalmers)

IUCA

Harvey Liszt (NRAO)

Introduction of participants

All

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11:00 Radio Astronomy in South Africa

SARAO, SKA & Radio Astronomy in South Africa	A. Tiplady (SARAO)
Engineering Aspects of MeerKAT & the SKA	J. Jonas (SARAO)
Science with MeerKAT	F. Camilo (SARAO)

14:00 Radio Science & Technology

Radio science and engineering basics	A. Clegg (Google)
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16:00: Radio Science & Propagation

Radio astronomy and radio telescopes	T. Tzioumis (CSIRO)
Radiowave propagation	C. Wilson (CSIRO)

Tuesday, 3 March 2020 – Spectrum Management

09:00 Spectrum Management

History and Principles of RF spectrum management	S. Cruz-Pol (NSF)
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11:00 Spectrum Management -The International Regulatory Structure

International spectrum management, basics and implications for Radioastronomy	V. Nozdrin (ITU)
The role of WP 7D	T. Tzioumis (CSIRO)
IUCAF and radio astronomy spectrum management at 60	H. Liszt (NRAO)

14:00 National and Regional Regulatory Structures and how they feed into the International structure

South Africa, African region	B. Sethole (SA)
USA	A. Zauderer (NSF)
Americas, CITELE	A. Zauderer (NSF)
Europe, CEPT, CRAF	W. Madkour (CRAF)
Asia-Pacific Region, APT, RAFCAP	M. Ohishi (NAOJ)

16:00 The Regulatory Structure in Practice

ITU-R Recommendations, RA series	M. Ohishi (NAOJ)
ITU-R Reports, RA series	M. Ohishi (NAOJ)
The ITU-R Radio Astronomy Handbook	T. Tzioumis (CSIRO)

Wednesday, 4 March 2020 – Meerkat or free day

Thursday, 5 March 2020

Quiet Zones, Coordination & Knowing Your Antagonists, Pycraf

09:00 Radio Quiet Zones in theory and practice	T. Tzioumis
RQZ around the world and ITU-R Report RA.2259	.F. Di Vruno (SKA)
External management of RQZ	A. Tiplady (SARAO)
Internal management of the Karoo RQZ	B. Otto/C. van der Merwe (SARAO)

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Internal management of Murchinson Shire RQZ	C. Wilson (CSIRO)
11:00 Satellite coordination; radar systems and their coordination	
Satellite coordination-I: Iridium, radar	H. Liszt (NRAO)
Satellite coordination: SpaceX	A. Zauderer (NSF)
Active sensors: Radar system bandwidth requirements	J. Colom-Ustáriz (NSF)
PR TARS coordination example	S. Cruz-Pol (NSF)
14:00 Pycraf afternoon - I	
Introduction to Pycraf	.F. Di Vruno (SKA)
Basic exercise	F. Di Vruno (SKA) 90
Friday, 6 March 2020	
RFI Detection, Measurement, Mitigation	
09:00 RFI detection and mitigation	A. Clegg (Google)
AI Techniques for RFI Discrimination	B. Bassett (SARAO)
RFI Mitigation	G. Hellbourg (CIT)
11:00 Measurement & Instrumentation	
Measurement and Analysis Tools & Techniques	B. Otto (SARAO)
A 4G/5G cell detection & monitoring setup for MRO	B. Indermuehle (CSIRO)
Measurement Infrastructure & Instrumentation	.B. Otto (SARAO)
14:00 Views from the outside looking in and the inside looking out	
An industry perspective	A. Clegg (Google)
Development of spectrum management system	V. Nozdrin (ITU-R)
15:00 Wrap up	

3 PARTICIPANTS

The school attracted 53 participants from Europe, Asia, the USA, Australia and South Africa.

Almost 20% of the attendees were female. The event was also attended by up to 5 local students.

The signed participants list is attached.



Global distribution of participants.



© Dineo Mahabo
SMS 2020 participants in the grounds of STIAS, Stellenbosch.

3.1 RADIONET NEWSLETTER

The names and email addresses of the subscribers for the Newsletter are attached.

4 RADIONET FINANCIAL CONTRIBUTION

The RadioNet contribution was used to cover travel costs for 9 attendees. Maximum level was €12,000, 11700€ were spent in total.

5 PUBLICATIONS

There are no publications from the school, but the presentations are archived at

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6 CONFIRMATION:

I confirm that RadioNet is allowed to publish this report, incl. participants lists, statistic's details, pictures, etc.