

# The Fifth International IUCAF School in Spectrum Management for Radio Astronomy

SIAS, Stellenbosch, South Africa 2-6 March, 2020

*Sponsored by IUCAF, CRAF, RadioNet*

## Scientific Organizing Committee:

A. Tzioumis (Co-Chair, Australia), H. Liszt (CO-chair, USA), P. Bolli (Italy), F. Di Vruno (Great Britain), W. van Driel (France), Balthasar Indermuehle (Australia), M. Lindqvist (Sweden), W. Madkour (Netherlands), M. Ohishi (Japan), B. Sethole (South Africa), A. Zauderer (USA), H. Zhang (China)

## South Africa Local Organizing Committee:

A. Tiplady (Chair), D. Mahabe, B. Otto, B. Sethole, T. Engel (transport and accommodation)

## Program (as of February 21)

### Monday, 2 March, 2020

#### 08:30 – 09:00 Registration

#### 09:00 Introduction

	<b>Ohishi</b>
Greetings from the SOC..... Tzioumis	5
Welcome from the sponsors	
SARAO .....Adrian Tiplady (SARAO)	20
Craf, RadioNet .....Michael Lindqvist (Chalmers)	20
IUCAF .....Harvey Liszt (NRAO)	20
Introduction of participants.....All	20
Administrative details.....T. Tzioumis	5

*(90 mins)*

*10:30-11:00 Coffee Break*

#### 11:00 Radio Astronomy in South Africa

	<b>Ohishi</b>
SARAO, SKA & Radio Astronomy in South Africa.....A. Tiplady (SARAO)	20
Engineering Aspects of MeerKAT & the SKA.....J. Jonas (SARAO)	40
Science with MeerKAT ..... F. Camilo (SARAO)	30

*(90 mins)*

*12:30-14:00 Lunch*

#### 14:00 Radio Science & Technology

**Lindqvist**

Radio science and engineering basics..... A. Clegg (Google)	90
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(90 mins)

15:30- 16:00 Break

**16:00: Radio Science & Propagation**

**Lindqvist**

Radio astronomy and radio telescopes .....T. Tzioumis (CSIRO) 30  
Radiowave propagation.....C.Wilson (CSIRO) 60

(90 mins)

17:30 end of 1<sup>st</sup> day program

**Tuesday, 3 March 2020 – Spectrum Management**

**09:00 Spectrum Management**

**Indermuehle**

History and Principles of RF spectrum management..... S. Cruz-Pol (NSF) 90

(90 mins)

10:30 – 11:00 Coffee break

**11:00 Spectrum Management -The International Regulatory Structure Indermuehle**

International spectrum management, basics and implications  
for radioastronomy .....V. Nozdrin (ITU) 30  
The role of WP 7D .....T. Tzioumis (CSIRO) 15  
IUCAF and radio astronomy spectrum management at 60.....H. Liszt (NRAO) 30

(75 mins)

Lunch 12:15 – 14:00

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

**di Vruno**

South Africa, African region.....B. Sethole (SA) 20  
USA.....A. Zauderer (NSF) 15  
Americas, CITELE .....A. Zauderer (NSF) 10  
Europe, CEPT, CRAF.....W. Madkour (CRAF) 30  
Asia-Pacific Region, APT, RAFCAP .....M. Ohishi (NAOJ) 15

(90 mins)

15:30 – 16:00 Coffee break

**16:00 The Regulatory Structure in Practice**

**di Vruno**

ITU-R Recommendations, RA series.....M. Ohishi (NAOJ) 60  
ITU-R Reports, RA series.....M. Ohishi (NAOJ) 30  
The ITU-R Radio Astronomy Handbook .....A. Tzioumis (CSIRO) 15

(105 mins)

17:45 end of 2<sup>nd</sup> day program

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**Wednesday, 4 March 2020 – Meerkat or free day**  
*Wine tour, anyone?*  
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**Thursday, 5 March 2020**  
**Quiet Zones, Coordination & Knowing Your Antagonists, Pycraf**

**09:00 Radio Quiet Zones in theory and practice** **Tzioumis**

RQZ around the world and ITU-R Report RA.2259.....	F. Di Vruno (SKA)	20
External management of RQZ.....	A. Tiplady (SARAO)	20
Internal management of the Karoo RQZ.....	B. Otto/C. van der Merwe (SARAO)	30
Internal management of Murchinson Shire RQZ.....	C. Wilson (CSIRO)	30

*(100 mins)*

*10:40 – 11:00 Coffee break*

**11:00 Satellite coordination; radar systems and their coordination** **Tzioumis**

Satellite coordination-I: Iridium, radar.....	H. Liszt (NRAO)	20
Satellite coordination: SpaceX.....	A. Zauderer (NSF)	15
Active sensors: Radar system bandwidth requirements.....	J. Colom-Ustáriz (NSF)	45
PR TARS coordination example.....	S. Cruz-Pol (NSF)	15

*(95 mins)*

*Lunch 12:35 – 14:00*

**14:00 Pycraf afternoon - I**

Introduction to pycraf .....	F. Di Vruno (SKA)	90
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*(90 mins)*

*Break 15:30 – 16:00*

**14:00 Pycraf afternoon - II**

Basic exercise .....	F. Di Vruno (SKA)	90
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*(90 mins)*

*17:30 end of 4<sup>th</sup> day program*

**19:30** *Conference Dinner*

**Friday, 6 March 2020**  
**RFI Detection, Measurement, Mitigation**

**09:00 RFI detection and mitigation** **Clegg**

AI Techniques for RFI Discrimination.....B. Bassett (SARAO) 30  
RFI Mitigation.....G. Hellbourg (CIT) 60  
(90 mins)

*10:30 – 11:00 Coffee break*

**11:00 Measurement & Instrumentation** **Clegg**

Measurement and Analysis Tools & Techniques.....B. Otto (SARAO) 30  
A 4G/5G cell detection & monitoring setup for MRO.....B. Indermuehle (CSIRO) 30  
Measurement Infrastructure & Instrumentation.....B. Otto (SARAO) 30  
(90 mins)

*Lunch 12:30 – 14:00*

**14:00 Views from the outside looking in and the inside looking out** **Liszt**

An industry perspective.....A. Clegg (Google) 30  
Development of spectrum management system .....V. Nozdrin (ITU-R) 30

**15:00 Wrapup (format tbd)** **Liszt**

*16:00 (Approximately) End of meeting*