

The Sixth International IUCAF School in Spectrum Management for Radio Astronomy

**Observatorio Astronómico Nacional (OAN)
Alcala de Henares**

29 September – 3 October 2025

Sponsored by IUCAF and OAN

Scientific Organizing Committee:

A. Tzioumis (Australia), B. Indermuehle (Australia), H. Zhang (China), B. Winkel (FRG), J. Józsa (FRG), F Di Vruno (GB), B. Sorokin (GB), M. Ohishi (Japan), M. Bautista (Spain), J. A. Lopez Perez (Spain), G. Hellbourg (USA), H. Liszt (USA), J. Williams (USA)

OAN Local Organizing Committee:

M. Bautista (Chair), P. deVicente (Director, Yebes Observatory), E. Martinez, E. Gonzalez., J. A. Lopez Perez

Program (* denotes a remote talk)

Monday, 29 September 2025

08:30 – 09:00 Registration

09:00 Introduction

Ohishi (moderator)

Greetings from the SOC.....Tzioumis 5

Welcome from the hosts and sponsors

IGN.....José A. López-Fernandez 10

IUCAF.....H. Liszt (NRAO) 10

Introduction of participants.....All 20

Administrative detailsM. Bautista, SOC 5

Invited: Spanish delegation for spectrum management.....Icár Ojugas/Julia Criado 20

Invited: IGN activities.....José A. López Fernández 20

(90 mins - these are all nominal sums of the listed times)

10:30-11:00 Coffee Break

11:00 Radio Astronomy in Spain (Yebes and IRAM)

Ohishi

Science at Yebes Observatory.....P. de Vicente 15

Technology development at Yebes Observatory.....José A. López-Pérez or M.Bautista 15

Invited: Yebes and QUIJOTE: A new golden age in astrochemistry...Jose Cernicharo (CSIC) 35

Invited: Radio astronomy at IRAM.....Miguel Sanchez (IRAM)* 25

(90 mins]

Lunch

14:00 Radio Science & Technology

Hellbourg

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

15:30- 16:00 Break

16:00: Radio Science & Propagation

Hellbourg

Radio astronomy and radio telescopesT. Tzioumis (CSIRO) 30
PropagationH. Suzuki (CSIRO). 35
A new broadband ambient spectrum monitoring system.....D. Bordenave (NRAO) 15
(80 mins)

end of 1st day program

Tuesday, 30 September 2025

Varieties of Spectrum Management and RQZ

9:00 Radio astronomy at the ITU-R

Józsa

International spectrum management, basics and implications
for radioastronomyV. Nozdrin (ITU) 30
The role of WP 7D T. Tzioumis (CSIRO) 15
(45 mins)

9:45 Regional and International radio astronomy organizations

Józsa

CRAF&CEPT.....W. Madkour (CRAF/JIVE) 15
RAFCAP&APT.....T. Tzioumis (CSIRO)/D. Oberoi (NCRA) 15
IUCAF&ITU-R.....H. Liszt (NRAO) 15
(45 mins)

10:30 – 11:00 Coffee break

11:00 Approaches to spectrum management by scientific organizations

Józsa

SKAO.....B. Sorokin, F. di Vruno (SKAO) 45
WMON. Donoho (WMO) 20
IEEE GRSS Frequency Allocations in Remote Sensing TC..Paolo de Matthaes (NASA) 20
(85 mins)

Lunch

14:00 National spectrum experiences

Sorokin

Australia, CSIRO..... T. Tzioumis (CSIRO) 15
China, SHAO.....B. Li (SHAO) 15
France, Nançay.....I. Thomas (Nançay) 15
Germany, MPIfR.....G. Józsa (MPIfR) 15
India, NCRA.....D. Oberoi (NCRA) 15
Japan, NAOJ M. Hiramatsu (NAOJ)* 15
(90 mins)

15:30 – 16:00 Coffee break

16:00 Radio quiet zones in theory and practice

Sorokin

RQZ around the world and ITU-R Report RA.2259.....	TBD	5
The US National Radio Quiet Zone	S. Wasik (NRAO)*	20
Spectrum Management and Radio Quiet Zones at ALMA	G. Siringo (ALMA)	20
Experiences while creating the DSA2000	G. Hellbourg (CalTech)	20
Protecting the Karoo RQZ while building SKA-Mid	C. Visser (SARAO).	15

(80 mins)

17:30 end of 2nd day program

Wednesday, 1 October 2025

Rules in the Morning, Site Visit in the Afternoon

9:00 The Radio Regulations

Di Vruno

Radio Regulations.....	H. Liszt (NRAO)	90
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(90 mins)

10:30 – 11:00 Coffee break

11:00 The radio astronomy literature at ITU-R

Di Vruno

ITU-R RA Recommendations & Reports.....	M. Ohishi (NAOJ)	90
The ITU-R Radio Astronomy Handbook	A. Tzioumis (CSIRO)	15

(105 mins)

Lunch

Afternoon

~3 pm leave for Yebes Observatory, ~7 pm on-site paella dinner

Thursday, 2 October 2025

Satellite Coordination, WRC-27 agenda and Pycraf afternoon

9:00 Satellite space-Earth issues

Tzioumis

94 GHz cloud profiling radars..	H. Liszt (NRAO)	15
9.6 GHz synthetic aperture radar (SAR)	H. Liszt (NRAO)	15
UEMR and Direct-cell measurements at CSIRO.....	L. Lourenço (CSIRO)	30

10:00 The WRC-27 Agenda

Tzioumis

Satellite space-Earth issues	G. Józsa (MPIfR), B. Sorokin & F. Di Vruno (SKAO)	
Agenda Item 1.13 MSS Direct-Cell		15
Agenda Item 1.16 RAS, RQZ.....		15

(90 mins)

10:30 – 11:00 Coffee break

Agenda Item 1.18 Resolution 739.....	15
Potpourri satellite Earth-space AI 1.1, 1.3, terrestrial submm radar 1.8...H. Liszt (NRAO)	30

New!!!

Registering radio Astronomy sites.....	B. Sorokin (SKAO) 25
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Lunch

14:00-15:30- Pycraf session 1

M. Bautista, F. Di Vruno, J. Józsa, F. Giovanardi

Introduction to compatibility study, pycraf introduction and hands-on exercise

15:30 – 16:00 Coffee Break

16:00-17:00/17:30 Pycraf session 2

Pycraf sub-packages and hands-on exercise

end of 4th day program

~19:30 Conference Dinner

Friday, 3 October 2025

RFI Detection, Measurement, Mitigation

09:00 RFI Detection, Measurement, Instrumentation, Suppression	Liszt
RFI mitigation.....	G. Hellbourg (CalTech) 60
Development and implementation of HTS filters for RFI suppression ...	P. Garcia (OAN) 15
The role of monitoring and measurements in protecting the	
RF spectrum environment in the KAROO	C. Visser (SARAO) 15
(75 mins)	

10:30 – 11:00 Coffee break

11:00 RFI Detection, Measurement & Instrumentation at SARAO	Liszt
Characterisation of equipment and installations.....	S.Snyman (SARAO) 20
Monitoring infrastructure and objectives.....	C. Visser (SARAO) 20
Impact Analysis and Interventions	S.Snyman (SARAO) 20
The Evolving Process of Monitoring, Measuring and Protection	C. Visser (SARAO) 15
(75 mins)	

Lunch

14:00 Perspectives and wrapup

Perspectives	A. Clegg (Valo Analytica), others?
Wrapup.....	OAN, IUCAF, others