

## Overview of RFI 2024

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*Radio Frequency Interference Conference (RFI2024)  
14-18 October 2024  
Bariloche, Argentina*

POS (RFI2024) 069

## 1. Introduction

The RFI 2024 conference was held from October 14–18, 2024, in San Carlos de Bariloche, Argentina, generously hosted by INVAP. This seventh edition of the conference brought together researchers, engineers, spectrum managers, and policymakers from around the world to discuss the challenges posed by radio frequency interference (RFI) across various scientific and technical disciplines.

The growing demand for spectrum access by new commercial and governmental services has made spectrum sharing increasingly complex, heightening the risk of interference to passive scientific services such as radio astronomy, remote sensing, and meteorology. The conference provided a crucial venue to promote collaboration among stakeholders working to mitigate RFI and ensure the integrity of scientific observations in an evolving spectral landscape.

RFI 2024 continued the legacy of previous conferences, following:

- **RFI 2022** – Online (hosted by ECMWF)
- **RFI 2019** – Toulouse, France
- **RFI 2016** – Socorro, New Mexico, USA
- **RFI 2010** – Groningen, Netherlands
- **RFI 2004** – Penticton, Canada
- **RFI 2001** – Bonn, Germany

## 2. Conference Venue and Events

The conference was hosted at INVAP, a leading aerospace and technology company in Argentina. Daily transportation was provided between downtown Bariloche and the venue.

Beyond the technical sessions, RFI 2024 featured several networking and social events, including:

- **Opening Reception** (October 14, 2024): Held at Cervceria Kunstmann, featuring local food and drinks.
- **Lake Excursion to Isla Victoria** (October 16, 2024): A scenic cruise across Lake Nahuel Huapi, providing attendees with breathtaking views and a guided tour of the island's natural and historical sites.
- **Conference Dinner** (October 17, 2024): A social dinner at Familia Weiss, a historic restaurant in Bariloche, offering a blend of Patagonian and European cuisine.

## 3.3 Keynotes and Sessions

### 3.1 Keynote Speakers

The conference featured six keynote speakers, covering a wide range of topics related to spectrum management, RFI mitigation, and scientific applications:

- **Darrah Blackwater** (Blackwater Consulting) – The Importance of Respecting Indigenous Spectrum Sovereignty
- **Natalia Donoho** (WMO) – WMO's Role in Spectrum Management: Communicating the Requirements of the Global Weather, Climate, and Water Communities

- **Vadim Nozdrin** (ITU) – The International Spectrum Management System through the Lens of Economic Theory
- **Otto Bruegmann** (NOAA) – Passive Instrument Radio Frequency Interference Above 10 GHz: Past, Present, and Future
- **Guillermo Gancio** (Argentine Institute of Radio Astronomy) – The Argentine Institute of Radio Astronomy and its Observatory: Present and Future
- **Tarcisio Bakaus** (ANATEL) – International Spectrum Management and Space Sustainability

### 3.2 Technical Sessions and Presentations

The conference was structured into multiple technical sessions, covering:

- **Spectrum Management (SM) Sessions:** Discussions on spectrum regulations, WRC-27 scientific agenda items, and strategies for balancing the needs of commercial and scientific spectrum users.
- **RFI Survey Sessions:** Presentations on real-world RFI measurements, including the impact of RFI on radio telescopes, weather radars, and remote sensing instruments.
- **Algorithm Development Sessions:** Novel techniques for RFI detection and mitigation, including machine learning approaches, statistical modeling, and new filtering methods.
- **Experimental Results:** Reports on practical efforts to mitigate RFI in various disciplines, including earth observation, passive microwave sensing, and astronomy.

### 4. Industry and Institutional Participation

Several major institutions, organizations and industry representatives participated, including:

- International Telecommunication Union (ITU)
- European Centre for Medium-Range Weather Forecasts (ECMWF)
- National Aeronautics and Space Administration (NASA)
- National Oceanic and Atmospheric Administration (NOAA)
- Square Kilometre Array (SKA) Project
- Various national spectrum regulatory agencies
- SpaceX

### 5. Tours and Site Visits

The conference featured several technical tours at INVAP, including:

- Satellite Integration Room (October 15, 2024)
- Satellite Testing Facilities (October 17, 2024)
- Radar Integration Facilities (October 18, 2024)

### 6. Organizing Committee

**Chairperson:**

Balthasar Indermuehle, CSIRO, Australia

**Co-Chairs:**

Willem Baan, ASTRON, The Netherlands  
Stephen English, ECMWF, United Kingdom  
Kirsty McBeath, Met Office, United Kingdom  
Alexandra Bringer, NASA, USA  
Flávio da Silva Jorge, ESA, The Netherlands  
Gregory Hellbourg, Caltech, USA  
Haiyan Zhang, NAOC, China  
Federico DiVruno, SKA, United Kingdom  
Ashley Vanderley, NSF, USA  
Paolo de Matthaeis, NASA, USA

**Local Organizing Committee:**

Federico Renolfi, INVAP, Argentina

**7.Sponsors**

The organising committee would like to express their gratitude to the many generous institutional and industry sponsors. The following organisations provided financial and/or logistical support for the conference:

- CSIRO
- INVAP
- URSI
- EUMETSAT
- NRAO
- IUCAF
- IEEE GRSS
- SpaceX
- SKAO
- ESA
- NASA
- World Meteorological Organization



Figure 1. Sponsors of RFI 2024.

### 8.8 Conclusions and Future Directions

The rapid growth of wireless communications, satellite constellations, and commercial spectrum use continues to pose challenges for scientific spectrum users. RFI 2024 successfully brought together experts from multiple disciplines to share knowledge and develop collaborative strategies for RFI mitigation. As the next World Radiocommunication Conference (WRC-27) approaches, continued engagement between the scientific, regulatory, and commercial communities will be essential to ensuring a sustainable and interference-free spectral environment for critical scientific applications.

The RFI conference series traditionally meets every two to three years. Given the rapid pace at which developments in the satellite and mobile technology sector are progressing, the organising committee decided to interleave the large in-person gatherings with an annual one day, online-only RFI conference. The first of these mini RFI conferences will take place in October 2025. The next in-person conference will take place in early 2027 and will be hosted by ESA in Europe.