Committee on Radio Frequencies (CORF)

March 23-25, 2026 | National Academies Space Science Week

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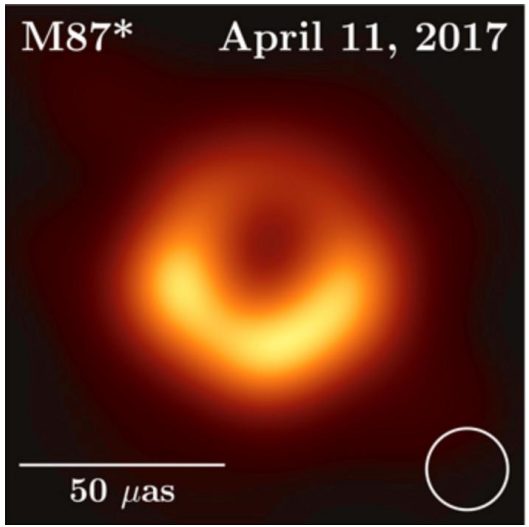
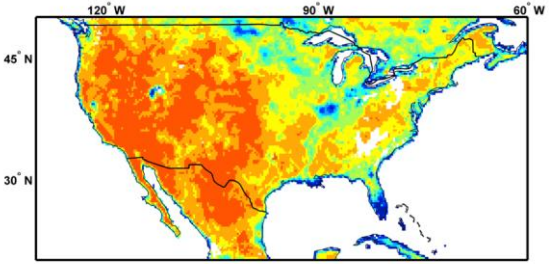
Protecting Scientific Use of the Radio Spectrum





- CORF addresses needs for, and protection of, scientific *passive* radio *services*
- *Radio Astronomy Service* (RAS): origins and evolution of Universe; chemistry and formation of stars and solar systems; matter in extreme environments; gravitational radiation; solar activity
- *Earth Exploration Satellite Service* (EESS): critical measurements of atmosphere, ocean, land, and cryosphere for weather, climate, and global change
- In contrast with *active services*, these passive services typically perform calibrated measurements of tiny changes in weak, noise-like natural signals
- Together, these activities represent billions of dollars in federal investment and have significant economic and cultural impact

Upper image: EHT image of M87 black hole at 230 GHz
Lower image: Soil moisture (1–10 July 2013) at 1.41 GHz

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CORF in detail

- CORF* represents interests of U.S. users of radio spectrum for astronomy and Earth science, both basic and applied
- CORF coordinates views of U.S. scientists and acts as a channel to represent their interests
- CORF recommends requirements and limits necessary to protect scientific use of radio spectrum from interference
- This is largely through filing comments in public proceedings of Federal Communications Commission (FCC)
- Comments are drafted by CORF and its legal counsel, then reviewed per standard National Academies protocols and approved and signed by President of the National Academy of Sciences
- CORF meets twice a year in person, maintains a Handbook of Frequency Allocations and Spectrum Protection for Scientific Uses, and conducts various forms of outreach to scientists and industry

* At the Academies, CORF is operated under the Center for Advancing Science and Technology, with regular interaction with the Board on Physics and Astronomy and the Space Studies Board

CORF's work is being driven by two major trends

- Growth in ubiquitous (often unlicensed) wireless devices
  - For Earth remote sensing, aggregate out-of-band emissions from thousands to millions of devices can lead to data loss or insidious interference
  - Emission at L-band in conflict zones ("GPS blocking") is notable

- Non-terrestrial networks supported by large satellite constellations
  - Nowhere is remote anymore
    - Radio astronomy tending to wide band observing outside protected bands
      - increase sensitivity
      - accommodate cosmological redshift
    - This has been enabled by remote location - no longer working

CORF filings in FCC proceedings this year - busy year

I. Lower 37 GHz band
(September 30, 2024 and May 30, 2025)

II. Modernizing Spectrum Sharing for Satellite Broadband
(July 3, 2025)

III. Satellite Spectrum Abundance
(July 28, 2025)

IV. Space Modernization for the 21st Century
(January, 2026)

V. Upper C-band (February, 2026)

VI. WRC-19 Implementation (March, 2026)

VII. 6GHz Unlicensed Devices on Cruise Ships (in progress)

VIII. Use of EESS Bands for Commercial Space Operations (in progress)

https://www.nationalacademies.org/units/BPAX-L-06-90-C/resources

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Takeaways

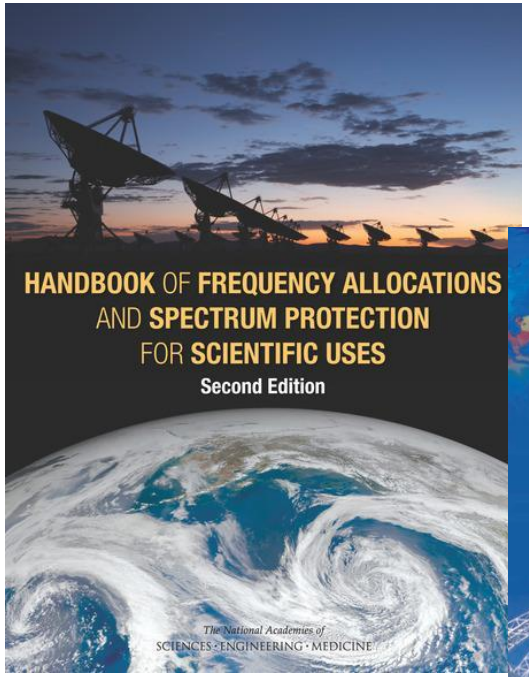
Summary

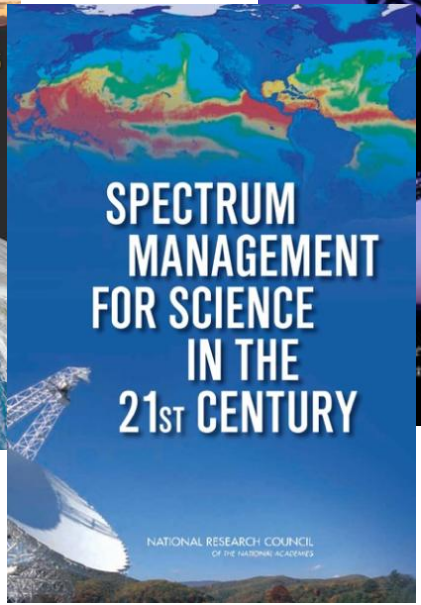
- Rapid growth of ubiquitous wireless devices and non-terrestrial networks poses a serious challenge to scientific use of the radio spectrum
- Vigilance and engagement by scientific community is extremely important to preserve existing capability and to enable continued advances
- CORF plays a major role here and has had impact
- Workload is increasing

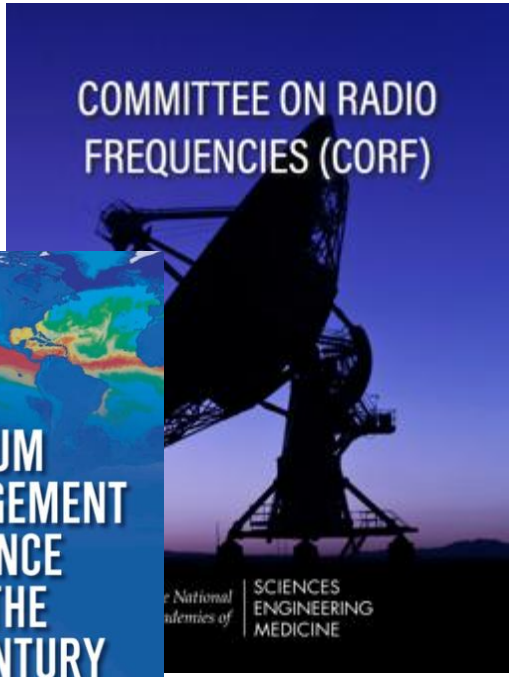
Cross-cutting issues to consider

- Science funding: Growing spectrum coordination and interference mitigation work is an added and often unfunded cost to scientific missions.
  - Importance of scientific users participating in discussions of regulations
- Environment: new satellite constellations impact environment as well as the radio spectrum
- Move towards deregulation/modernization of rules

CORF (and related) Publications







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Available for download from the National Academies Press