National Science Foundation

CORF Meeting

April 25, 2007

Tomas E. Gergely

Electromagnetic Spectrum Manager

National Science Foundation

tgergely@nsf.gov

703-292-4896

National Science Foundation

National Issues

- **NTIA changes:**
  - Administrator: J. Knauer confirmed as NTIA Administrator
  - Associate Administrator, OSM : F. Wentland retired, K. Nebbia acting (also, IRAC Chairman)
- **FCC changes:**
  - All (5) FCC Commissioners in office -
  - FCC is becoming more active once again –
    - several draft NPRMs in the work
      - V-band (includes 43 GHz RA band)
      - VMES

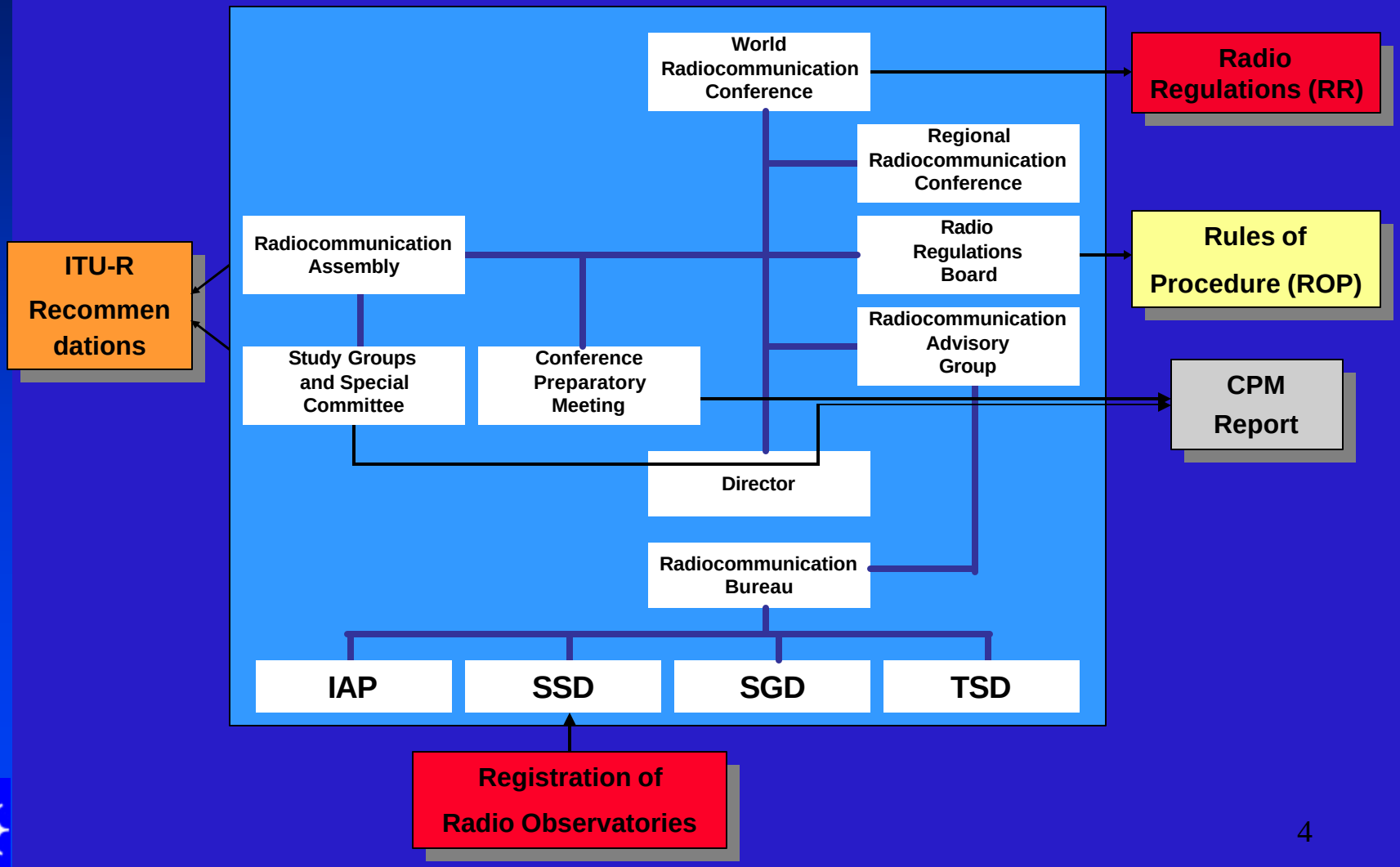
National Science Foundation

Strategic Spectrum Planning:

- NSF Long Range Spectrum Plan compiled by T. Gergely and A. Clegg, released in November, 2005
- Covers all/most spectrum related NSF activities:
  - ✓ Radio and radar astronomy
  - ✓ Upper and lower atmospheric research
  - ✓ Polar Programs
- Radio Astronomy trends noted:
  - > Coverage of broad spectral range, outside allocated radio astronomy bands, required by the science
  - > Observations at higher and higher frequencies, covering up to the THz region
  - > Does not anticipate requests for additional spectrum allocations to radio astronomy below 275 GHz
  - > Anticipates need for spectrum allocations for radio astronomy in the 275-1000 GHz range, within the next decade
- Update due November, 2007
- Please give us comments, errors, revisions needed, etc

National Science Foundation

How Do Radio Astronomers Interact with the ITU-R ?



National Science Foundation

The ITU-R Study Groups

- Operate in cycles, between World Radiocommunications Conferences (WRCs)
- Cycles end with the Radiocommunications Assembly, held just before the WRC.
- Study groups (of importance to radio astronomers):
  - SG 1 Spectrum management
  - SG 3 Radio wave propagation
  - SG 4 Fixed Satellites
  - SG 6 Broadcasting
  - SG 7 Science Services
  - SG 8 Mobile, Amateur, Radiolocation and related Satellites
  - SG 9 Fixed Service
- Structure likely to change at next RA

National Science Foundation

WP 7D

- WP 7D (at present one of four within SG 7)

  Mission:

  - Develop and maintain Radio Astronomy Related Recommendations, Reports and Handbook
  - Prepare draft CPM text

- 2 International meetings/yr, held mostly at ITU Hqrs, Geneva
- Next meetings: March, 2008 (Geneva), Sept, 2008 Japan (?)
- Chaired by M. Ohishi (Japan)
- US WP 7 D ~60 members; ~15 active participants, less than half of whom are astronomers
- ~ 10 meetings/year (at NSF –accessible by phone)

National Science Foundation

Recommendations in the ITU-R RA Series

Number	Title
Rec. ITU-R RA.314-10 (03)	Preferred Frequency Bands for Radioastronomical Measurements
Rec. ITU-R RA.479-5 (03)	Protection of Frequencies for Radioastronomical Measurements in the Shielded Zone of the Moon.
Rec. ITU-R RA.517-3 (03)	Protection of the Radioastronomy Service from Transmitters in Adjacent Bands
Rec. ITU-R RA.611-3 (03)	Protection of the Radioastronomy Service from Spurious Emissions
Rec. ITU-R RA.769-2 (03)	Protection Criteria Used for Radioastronomical Measurements
Rec. ITU-R RA.1031-1 (95)	Protection of the Radioastronomy Service in Frequency Bands Shared with Other Services
Rec. ITU-R RA.1237-1 (03)	Protection of the Radioastronomy Service from Unwanted Emissions Resulting from Applications of Wideband Digital Modulation
Rec. ITU-R RA.1272-1 (02)	Protection of Radioastronomy Measurements Above 60 GHz from Ground Based Interference
Rec. ITU-R RA.1417 (99)	A Radio-quiet Zone in the Vicinity of the L2 Sun-Earth Lagrange Point
Rec. ITU-R RA.1513-1 (03)	Levels of Data Loss Acceptable to Radio Astronomy Observations and Percentage-of-Time Criteria Resulting from Degradation by Interference for Frequency Bands Allocated to the Radio Astronomy Service on a Primary Basis
Rec. ITU-R RA.1630 (03)	Technical and Operational Characteristics of Ground-based Astronomy Systems for Use in Sharing Studies with Active Services Between 10 THz and 1 000 THz
Rec. ITU-R RA.1631 (03)	Reference Radio Astronomy Pattern to Be Used for Compatibility Analysis Between non-GSO systems and Radio Astronomy Stations Based on the epfd Concept

National Science Foundation

WP 7D –Documents Approved During the Current Cycle (2003-2007)

- **Revision of Recommendations RA 517, 611, 1031**
  - **Update Tables in Recs. 517, 611, Eliminate repetitious text**
- **New Recommendation on Mutual Planning Between Radio Astronomy and Remote Sensing (CloudSat) operations in the 94 and 130 GHz Bands (Emerson/Liszt)**
  - **Development of Cloud Profiling Radars and Radio Telescopes operating in these bands should take place in close contact between the interested communities**
  - **Some guidelines for the avoidance of receiver damage, interference and coordination**
- **New Report - High Precision Timing of Pulsars (Lewis)**
- **New Report - Mitigation Techniques in Radio Astronomy (Ellingson/Lewis)**
- **Quiet Zones – New Question (Liszt)**

National Science Foundation

WP 7D –Other Documents Current Cycle

- **Frequency Sharing Between the Radio Astronomy Service and Other Services Above 70 GHz (Liszt/Gergely)**
  - Describe US process
- **Development of Justification for Allocations to Radio Astronomy in the 275-1 000 GHz Range (Clegg)**
- **BPL (Clegg)**

National Science Foundation

WP 7D Work Planned for Next Cycle

Cycle begins after WRC-07 (2008)

- **Review of Questions on Space Radio Astronomy**
  - **Questions 230/7 and 241/7 nearly identical,**
  - **Q 241/7 suppressed at last meeting**
  - **Any Need to revise Q 230/7?**
- **Review and Revise Recommendation 1513**
  - **Review inconsistencies with Recommendation 1031**
- **Review and Revise Recommendation 314 on "Preferred Frequency Bands for Radioastronomical Measurements"**
  - **Split Recommendation to Below and Above 275 GHz?**

National Science Foundation

WP 7D Work Planned for Next Cycle(2)

- Begin Development of Recommendation to Avoid Destructive Interference to RA Receivers
- Comparison of Threshold Levels in Rec. ITU-R RA.769-1 and 769-2
- Update Report on Mitigation Techniques in Radio Astronomy
- Progress Work on Quiet Zones, in Response to Approved Question
- Progress Work on Channel Capacity Document, withdrawn this cycle
- Work on Impact (and Opportunities) of Software Defined Radio (SDR) on Radio Astronomy
- Moon, Mars initiative
  - Astronomy requirements