



# Ruminations about Spectrum

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# Declining Presence of RA on US Soil

- VLBA, Arecibo under threat of closure
  - Would diminish # of sites considerably
- New instruments offshore (LMT,ALMA)
  - US not a candidate to host SKA
- New instruments are shared, multinational
  - There may never be another “NRAO” instrument ... or eventually any at all
- Requires a new approach to US spectrum management

# Isolated and Marginalized?

- Radio astronomy is being forced onto reservations
- Not all of these are well-isolated
- Isolation is no longer assured even so
  - RFI sources jumping flea-like onto ESV (ships), airborne and spaceborne platforms
- New international instruments located in national RQZ *sans* international recognition
  - Regulate only fixed, ground-based transmitters

# Isolated and Marginalized?

- Often protected only in narrow bands which don't provide spectra of distant Universe
  - Broad bands above 100 GHz are exceptions
  - No allocation above 275 GHz - push harder?
- Why have protected bands at all?
  - Sole basis for participation in Geneva. FCC?
  - Some bands are shared anyway
  - Sometimes they even work! – Galactic H I, OH

# Spectrum Demand Only Grows

- C-band under strong pressure to provide ~600 MHz for airborne mobile at WRC07
  - Flight testing, unmanned vehicles (UAV)
- AWS has overrun the 1720 MHz OH line
- Digital TV transition
  - Blamed for failure of prospective CfA Epoch of Reionization (EOR) project on VLA
  - Unknown impact of “TV Band Devices”
  - LWA near VLA site?

# Spectrum Demand Only Grows

- Ultrawideband technologies
  - ‘Wireless USB’ is 3.1 – 10.6 GHz UWB
  - Car radars at 24 and 76 GHz
  - Indistinguishable from broadband noise?
  - Causing great stress in Europe, where coordination zones were mandated
  - Foreseen to be ubiquitous
    - Car tire-pressure sensors
    - Proximity sensors on hand tools

# Traditional SM Mechanisms Stressed

- ITU struggled in addressing protection of passive services “Compatibility of different active and passive services”
  - TG 1/3 - 1/9 1993 – now
    - GLONASS trying to evade non-binding consultation
  - UWB recommendations -TG1/8
- Antagonisms growing in Europe
  - Bosch campaigned for suspension of protected bands, claimed (in Der Spiegel!) that RA would kill people if coordination was imposed on UWB car radars

# Traditional SM Mechanisms Stressed

- Traditional method is that astronomers swarm to problems like antibodies
  - “90% of life is just showing up” (Woody Allen)
- Has been very effective, but all bases are not covered
- Progress is made slowly
  - Protected bands above 275 GHz were IUCAF goal in the 1960's
  - A framework for international recognition of radio quiet zones doesn't exist yet



# Growth areas for SM

- Encourage ALMA to engage fully in spectrum management
  - The bulk of the \$\$ must support SM
- Engage with Region 2 and WRC issues at CITEL
  - WRC proposals need strong regional support
  - CITEL doesn't have any consciousness for RA
  - Region 2 (Americas) lacks a regional spectrum management group like CRAF, RAFCAP