Proposal Title: A Deep Arecibo 1 to 10 GHz Spectral Scan of Arp 220

ABSTRACT:

Following our earlier, shallow Arecibo spectral scan of Arp 220, we propose a follow-up, deep survey using the Mock spectrometer in “single-pixel” mode. This should more than double the signal-to-noise ratio of the data, and among the expected detection of a large number of new molecular lines, we anticipate species and isotopologues that will be new for these frequencies. The results will contribute to our understanding of the physical and chemical conditions in the central regions of this prototype Ultra Luminous Infra-Red Galaxy (ULIRG). Essentially the whole frequency range between 1.1 and 10.0 GHz will be searched with noise levels at, and below, \( \sim 60 \mu \text{Jy beam}^{-1} \) for a velocity resolution of 30 kms\(^{-1}\). A total of 90 hr observing time is requested.

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<tr>
<th>Name</th>
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Remote Observing Request

- [x] Observer will travel to AO
- [ ] Remote Observing
- [ ] In Absentia (instructions to operator)

Instrument Setup

- L-wide
- C S-low
- X-band
- S-high
- C-high

Atmospheric Observation Instruments:

Special Equipment or setup: All receivers requested have equal priority, but not all need to be available at the same time.

RFI Considerations
Frequency Ranges Planned

1100 - 10,000

This proposal requires Iridium RFI protection at 1612 MHz between 10pm and 6am EST.
This proposal requires coordination with Punta Salinas radar within the band 1222-1381 MHz.
This proposal requires coordination with GPS L3 at 1381 MHz.