

## Technical Page

Proposal Type: Large  
 General Category: Astronomy  
 Sub-Category: Spectroscopy  
 Observation Category: Extragalactic  
 Total Time Requested: 455 Hours  
 Minimum Useful Time: 60 min

**Proposal Title:** An All-Stokes, All-Line Survey of OH Megamasers in Ultraluminous Infrared Galaxies

*ABSTRACT:*

All OH megamasers (OHMs) are observed in luminous infrared galaxies, strongly favoring the most FIR-luminous, the ULIRGs. OH is the most sensitive magnetic tracer in molecular regions; in our Galaxy, OH masers probe fields of up to 10 milligauss. However, until recently, OHMs had not been utilized as an extragalactic magnetometer. The authors have used Arecibo to detect Zeeman splitting in OHMs and have increased the sample of extragalactic Zeeman detections 16-fold finding a typical field in ULIRGs of about 3 milligauss. These results mark the first time in-situ magnetic fields are measurable at cosmological distances. We propose to use 455 hours of time to survey the entire sample of OHMs visible to Arecibo in full-Stokes mode. This will be the first extragalactic Zeeman survey and the first systematic search for satellite lines in OHMs.

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### Remote Observing Request

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

### Instrument Setup

L-wide

### Atmospheric Observation Instruments:

**Special Equipment or setup:** none

### RFI Considerations

## Frequency Ranges Planned

1240-1720

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.