

# A search for pulsars in the central parsecs of the Galactic center

Andrew Siemion<sup>1</sup>, Matthew Bailes<sup>2</sup>, Geoff Bower<sup>1</sup>,  
Jayanth Chennamangalam<sup>3</sup>, Jim Cordes<sup>4</sup>, Paul Demorest<sup>5</sup>,  
Julia Deneva<sup>6</sup>, Gregory Desvignes<sup>7</sup>, John Ford<sup>5</sup>, Dale Frail<sup>5</sup>,  
Glenn Jones<sup>8</sup>, Michael Kramer<sup>7</sup>, Joseph Lazio<sup>9</sup>, Duncan Lorimer<sup>3</sup>,  
Maura McLaughlin<sup>3</sup>, Scott Ransom<sup>5</sup>, Anish Roshni<sup>5</sup>, Mark Wagner<sup>1</sup>,  
Dan Werthimer<sup>1</sup> and Robert Wharton<sup>4</sup>

<sup>1</sup>University of California, Berkeley  
email: [siemion@berkeley.edu](mailto:siemion@berkeley.edu)

<sup>2</sup>Swinburne University

<sup>3</sup>West Virginia University

<sup>4</sup>Cornell University

<sup>5</sup>National Radio Astronomy Observatory

<sup>6</sup>Arecibo Observatory

<sup>7</sup>Max Planck Institute for Radio Astronomy

<sup>8</sup>California Institute of Technology

<sup>9</sup>Jet Propulsion Laboratory

**Abstract.** The discovery of a pulsar or pulsars orbiting near the Galactic Center (GC) could offer an unprecedented probe of strong-field gravity, the properties of our galaxy's supermassive black hole and insights into the paradoxical star formation history of the region. However, searching for pulsars near the GC is severely hampered by the large electron densities along our line of sight and the scattering-induced pulse broadening of the pulsar emission observed through it. As the broadened pulse length approaches the pulsar period, the periodicity in pulsar emission becomes nearly undetectable. Searches extended to higher frequencies, in an effort to reduce scattering, suffer from reduced intrinsic flux, higher system temperatures and increased atmospheric opacity. We are currently attempting to mitigate the challenges associated with searching for pulsars near the GC by employing new wide bandwidth receivers, upgraded IF distribution systems and novel digital spectrometers in a GC pulsar search campaign at the Green Bank Telescope in West Virginia, USA.

Our search will cover two frequency bands, from 12-15 GHz (Ku Band) and 18-26 GHz (K Band), during a total of approximately 30 hours of observations, with expected characteristic 10-sigma sensitivities between 5-10 micro-Jy. Our first observations are scheduled for mid-March 2012. Here we will present the status of our observations and initial results.