



Einstein@Home

Scientific and Technical Update

BOINC Workshop 2018

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Einstein@Home

searches for signals from spinning neutron stars ("pulsars") in data from

- Gravitational Wave (LIGO)
- Gamma-Ray (Fermi-LAT) and
- Radio-Wave (Arecibo)

observatories with (currently) 5 applications

Gamma-Ray (so far)

- Survey „FGRP4“ ended a year ago
- Highly successful, 17 new GR pulsars found
- Two publications (13+2 pulsars), see <https://einsteinathome.org/science/publications>
- Most prominently the only known radio-quiet Millisecond-pulsar
 - Published in Science Advances Feb 2018
 - „Radio-quiet“: no constraints from other observations, „blind“ search, requiring huge computing power, provided by E@H

Gamma-Ray (now & beyond)

- „FGRP5“ successor to FGRP4, search for isolated GR-pulsars, CPU
- „FGRPB1“ search for GR-pulsars in circular binary orbits, GPU
- Both successful, results to be published
- Search for GR-pulsars in elliptical binary orbits is being prepared (extends parameter space by two dimensions)

Gravitational Waves

- Newest data from LIGO detectors ("O2")
- New features exhibit surprising interactions with what we've been using for years:
 - adaptive replication: less "unsent" tasks, shadows rare (data-dependent) computation issues
 - "cluster optimization": bypass locality scheduling and just sent oldest unsent tasks

GDPR

(European Data Protection)

- E@H is of most active projects (Oliver, Shawn)
- Drupal-based web code
- Locked down **anonymous** stats export after coordinating with major stats sites, public discussion and announcement in advance
 - Few issues / complaints
 - Currently 8 registered „Clients“
 - Gridcoin needs to update their software, fast-tracks Einstein@Home