DRAGNET

One sentence summary: *The DRAGNET project greatly extends LOFAR's detection and localization capabilities for pulsars and fast radio transients.*

Introduction

Studying the extreme astrophysics of neutron stars, black holes and other exotica is key to understanding fundamental gravitational and particle physics. Extreme astrophysical phenomena are fleeting, however, and it is a major observational challenge to detect such fast “transients”.

DRAGNET extends LOFAR with a high-speed, wide-angle radio camera mode that is capable of detecting and localizing fast radio transients in real time. We will scan the sky for sub-second bursts coming from previously unpredicted or unobserved astrophysical phenomena, while simultaneously observing hundreds of known radio-emitting neutron stars (pulsars).

The DRAGNET project started in Jan 2014 and runs for 5 years. It is funded by an NWO VIDI and an ERC Starting Grant (+ some funding from NOVA) covering about 8 fte over 3 institutes.

Work Packages

- WP1: Wide-field transient searches
- WP2: Developing DRAGNET++
- WP3: Neutron star monitoring
- WP4: Characterizing the transient radio sky
- WP5: Understanding neutron star magnetospheres

Publications

- DRAGNET description paper
- …

Projects and Partners

LOTAAS and DRAGNET searches

- Benchmarks of the LOTAAS pipelines
- Observing modes
- psrfits2fil

ASTRON/LOFAR

- LOFAR Transients Key Science Project
- LOTAAS discoveries

Project Members

- Jason W. T. Hessels (ASTRON, University of Amsterdam) (PI)
- Vlad Kondratiev (ASTRON) (science postdoc)
- Cees Bassa (ASTRON) (science postdoc)
- Alexander S. van Amesfoort (ASTRON) (technical developer)
- Daniele Michilli (University of Amsterdam) (PhD)
- Amruta Jaodand (University of Amsterdam) (PhD)
- Sotiris Sanidas (University of Amsterdam) (science postdoc)
- *TBD* (Oxford University) (technical developer)

Infrastructure

- Cluster Usage: login, environment, hostnames, job submission with SLURM, …
- System Software: raw list of non-default system settings and installed applications on top of ansible config
- Hardware Specifications: cluster figure, types of CPUs, memory, disks, GPUs, networks, …
- Cluster benchmark numbers: measured performance of various components on synthetic workloads (upper bounds)
- GPU Cluster Tendering (2015)

Presentations

Status

- DRAGNET presentation for LOFAR Status Meeting (LSM) (19 Aug 2015)
- DRAGNET presentation for CEPWAN meeting (23 Oct 2014)

Grants

- Original DRAGNET presentation for ERC Committee (2013)