New Science in radio astronomy
Applying cutting-edge technology to enhance the entire data chain from receivers to final output

RADIO BLOCKS

building blocks to increase the science delivery potential of radio astronomical observatories

31 partners - 4 years
started on 1 March 2023
9M Euros from EC HE programme
3M Euros from non-EC partners

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DETECTORS
develop key components for future sensitive, wideband receivers

RECEIVERS
improve system temperature, bandwidth and field-of-view

CORRELATORS
efficient high-performance signal processing based on FPGA or GPUs

PROCESSING
analysis toolkit for rapid, reproducible and scalable analysis of data products

This project has received funding from the European Union's Horizon Europe research and innovation programme under the grant agreement No 101093934

RADIO BLOCKS

DETECTORS

develop key components for future sensitive, wideband receivers

From the EVN roadmap:
higher sensitivity
broad-band receiver systems

Development of key components for future sensitive, wideband receivers for European research infrastructures EVN, ALMA, NOEMA, IRAM-30m, and the SKA.

- RF windows, lenses, filters for mm and sub-mm arrays
- Horns
- SIS mixers
- RF Low noise amplifiers
- IF Low noise amplifiers
- Local Oscillators

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RADIO BLOCKS

RECEIVERS

improve system temperature, bandwidth and field-of-view

From the EVN roadmap:
wider field of view
wider bandwidth

Improvements on the technology areas of system temperature, bandwidth and field-of-view.

- Wide-field astronomy
  - Novel Beamforming technology
  - PAF design and implementation
  - Demonstrators
- Wide-band astronomy
  - DBBC4 VLBI backend demonstrator
  - Broadband digitizer
- Multi-pixel astronomy via Focal Plane Arrays

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CORRELATORS

efficient high-performance signal processing based on FPGA or GPUs

From the EVN roadmap:
next generation correlators

Deliver a collection of efficient, high-performance signal processing building blocks exploiting commercially available hardware accelerator platforms (FPGA, GPUs) that partners can use to construct a next-generation correlator.

- Next Generation Correlators building blocks
- Prototypes for:
  - EVN, LOFAR, e-MERLIN, ALMA
- High-speed Data Transport Development

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RADIO BLOCKS

PROCESSING

analysis toolkit for rapid, reproducible and scalable analysis of data products

From the EVN roadmap:
refined data processing

Provide modular, open-source and flexible analysis toolkit components to enable rapid, reproducible and scalable analysis of the large-volume and complex data products.

- The impact of DASK on automated processing workflows for Radio Astronomy data
- Develop a generic and scalable fringe fit calibration implementation in the DASK framework
- Simulations for optimizing calibration and parameter extraction
- Bayesian inference for sparse visibility data
- Modular PAF Backend Processors toolkit

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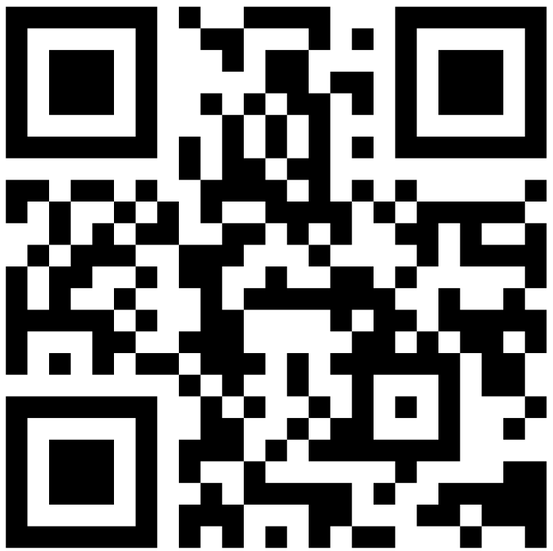
https://www.radioblocks.eu/



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