

Monika Obrocka

RESEARCH DATA SCIENTIST

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Experience

SKA SA Science Data Processing

Cape Town, SA

RESEARCH DATA SCIENTIST

Sep 2016 - PRESENT

- Developing of algorithms and software related to dealing with data pipelines and data management
- Developing the advanced radio frequency interference excision and mitigation techniques to allow for the most sensitive observations
- Building a robust RFI detection system, with identification of known sources and flagging of unknown types of signals, anomalies
- Applying machine learning techniques to discover new astrophysics
- Coaching and mentoring graduate and postgraduate students enrolled in the Young Professionals Development Programme
- **Tools:** Docker, CWL, PostgreSQL, MySQL, Python, Git, Linux

SKA SA Digital Back-End

Cape Town, SA

DIGITAL SIGNAL PROCESSING ENGINEER

March 2015 - Sep 2016

- Architecting the system and designed algorithms in MATLAB with domain expertise in DSP and radio astronomy
- Experience in digital communications protocols and networking on high-speed (100GGE/S) lab equipment in data center
- Developed on large Xilinx FPGAs
- Documentation generation: requirements, design, interface and test specifications
- **Tools:** Matlab/Simulink, Core9, Python, Git, Linux

Science and Technology Facilities Council RAL Space

Oxford, UK

RF MICROWAVE ENGINEER

Sep 2010 - May 2011

- Designed, fabricated and created an assembly for broadband LNA
- verified components performance characteristics and link budget analysis
- **Tools:** HFSS, ADS, Windows

Science and Technology Facilities Council ISIS

Oxford, UK

AUTOMATION ENGINEER

Sep 2009 - Aug 2010

- Designed and built control software to support and automate muon experiments
- Provided programming, troubleshooting, testing/measurement and technical support
- **Tools:** LabView, National Instrument DAQ systems, Windows

Projects

Transients and Pulsars with MeerKAT

Cape Town, SA

TRAPUM <http://www.trapum.org/>

2015 - PRESENT

- Processing Working Group: covers development and operation of processing infrastructure for TRAPUM.
- Data Working Group: Covers archiving, storage, accessibility, traceability.

IBM Research - Africa

Cape Town, SA

COGNITIVE SYSTEMS <http://www.research.ibm.com/labs/africa/>

2016 - PRESENT

- Joint patent: Identification of RFI
- Use of machine learning to improve the computational infrastructure of the MeerKAT radio telescope.

Breakthrough Initiatives

Cape Town, SA

SETI BREAKTHROUGH LISTEN <https://breakthroughinitiatives.org/initiative/1>

2016 - PRESENT

- Machine learning and big data techniques to distinguish between terrestrial sources of interference, and potential extraterrestrial signals.

Education

PhD, Radio Astronomy

Manchester, UK

MANCHESTER UNIVERSITY

2011 - 2015

- **Title:** High-time resolution astrophysics using digital beamforming

BEng in Electronic Engineering

Birmingham, UK

ASTON UNIVERSITY

2007 - 2011

- First Class with placement year