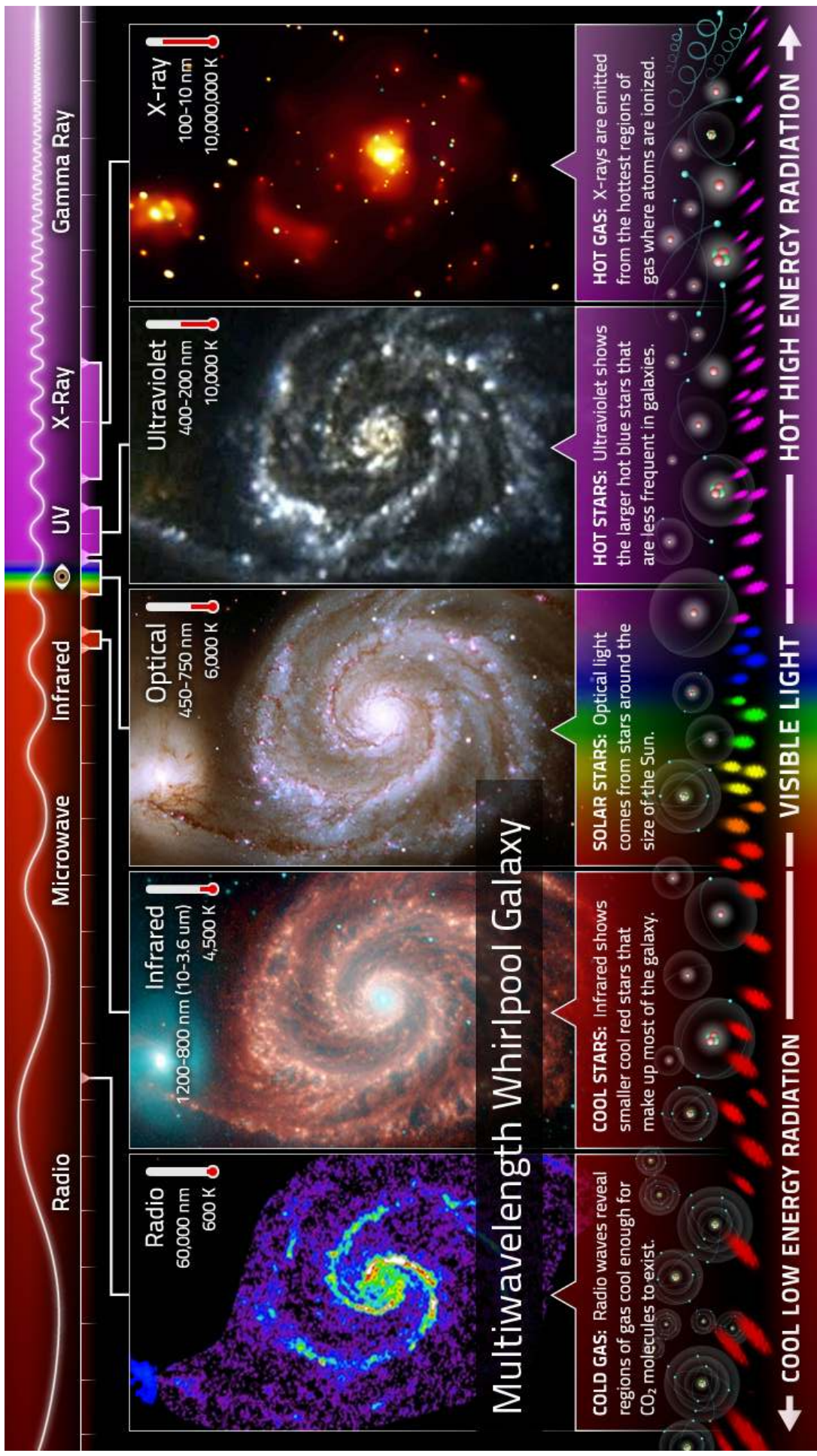


CHALLENGES AND FUTURE OF RADIO TELESCOPES IN SOUTHEAST ASIA

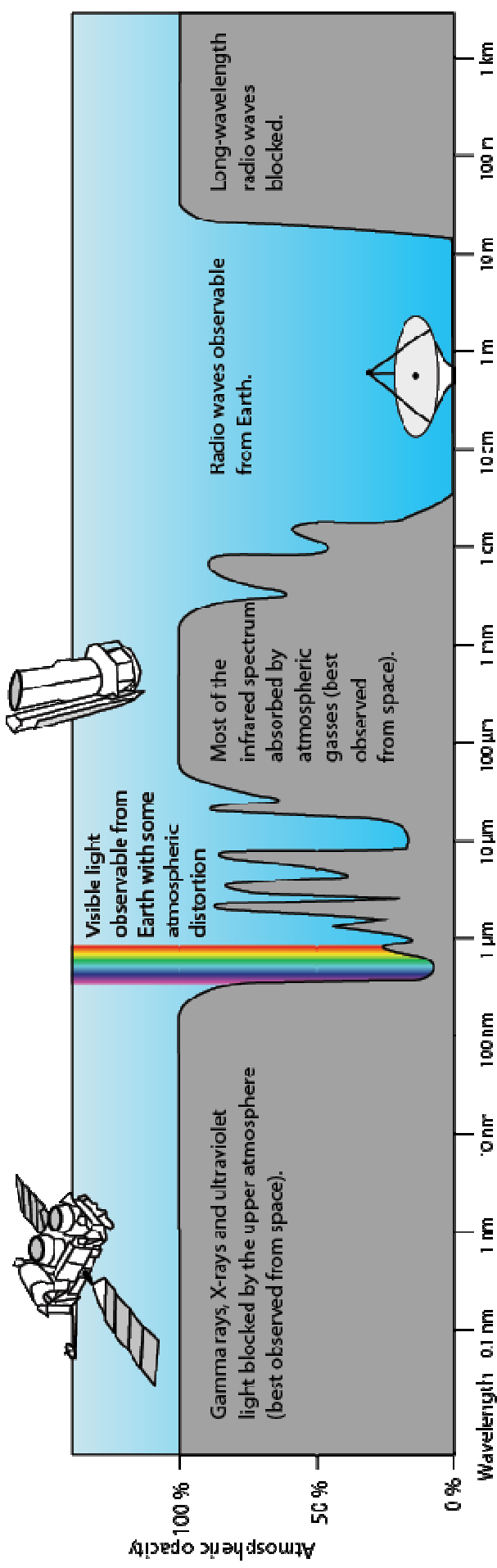


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MALAYSIA

RADIO ASTRONOMY



RADIO ASTRONOMY





Members:
**Assoc Prof Dr Zamri Zainal Abidin, Dr Zainol Abidin Ibrahim,
Dr Norsiah Hashim, Dr Roslan Umar, Dr Zety Sharizat, Dr Nikouravan,
Dr Noraisyah, Dr Mahidzal, Dr Nasser, Dr Ferwani**

PhD students: **Jazeel Hussein, Israa, Amirul Nizam, Mustapha Abbas, Zulfazli Rosli**

MSc students: **M Shaiful Rizal, Noorkhallaq Noorzian, Aqma Iryani, Nabilah Ramli, Kiew Ching Yee,
Norhidayah, Indriani Sukma, Farah Aqilah, Tan Wei Shen, M Shazwan**

Collaborators (local)
**Tariqul Islam, Mohd Ramlee, Sharul Kamal, Abdul Halim Abdul Aziz, Wan Zul Adli
Aduwati Sali, Shaiful Jahari, M Khair, Asnor Juraiza, Azura, Radial Anwar, Mohd Fairos**

10 Researchers
5 PhD Students/Lecturers
10 MSc students
11 Lecturers other Universities
2 Others
6 BSc project students
2 MSc (C) project students

International Collaborators:

NAOC (China)
YNAO (China)
XAO (China)
NCU (Taiwan)
JBCA (UK)
KASI (Korea)
SUT (Thailand)
NRIAG (Egypt)
ITB (Indonesia)

RADIO ASTRONOMY IN UM

- Main science goals:
 - Spectrum Management for Radio Astronomy
 - Protecting Radio Astronomy Spectral Windows
 - Radio Frequency Interference (RFI) study
 - Cosmology & Deep Space Physics
 - Dark Matter study (Rotation Curve and in Galaxy Clusters)
 - Evolution of Galaxy Clusters (HI), Pulsars, Formadehyde, SFR
 - Space Weather
 - Solar radio monitoring: Solar bursts, earthquake, effect on radio telecommunication instruments
 - Ionospheric/Atmospheric – Solar activity relation

RADIO ASTRONOMY IN UM

PAST

PRESENT

FUTURE



2005 – Jupiter radio storm detection

2006 – Radio meteor observation

2007 – Collaboration with JBCA

– **UMRT-1 (1.5 m); UM**

2008 – SEAN WG RA

– Radio Frequency Interference (RFI)

– **UMRT-2 (2.3 m); INSTUN**

2010 – Dark Matter & Solar Groups

2011 – Collaboration with NARIT, Thailand

– Galaxy cluster observation with 7m

JBO radio telescope

– Collaboration with SISSA, Italy

(Prof Paolo Salucci)

2012 – Space Weather with e-CALLISTO

– Collaboration with ICRAR, Perth

2013 – Collaboration with NCU, Taiwan

– Collaboration with CSIRO, Sydney

– Collaboration with AUT, Auckland

– Collaboration with YNAO

2014 – **UMRT-3 (7 m); UPSI**

– **Collaboration with NAOC, China**

– **Collaboration with YNAO, China**

2015 – **Collaboration with NRIAG, Egypt**

2016 – **Collaboration with SUT, Thailand**

2017 – **Collaboration with SUT, Thailand**

2018 – First light with UMRT-3

- Solar Burst Array

System (YNAO)

- MWA with ICRAR

2020 – MAS-AUST VLBI

network

2021 – **UMRT-4 (15-20m)**

2021 – MAS-CHI VLBI

network

2022 – Asia-Oceania VLBI

network

2022 – SKA with ICRAR and

CHINA

RFI/RQZ Study

Outreach and promotions

RFI monitoring

Outreach and Promotions

SITE 1 for future radio telescope : **Jelebu**



SEMINAR FALAK NUSANTARA 2018 TANJUNG MALAIM, PERAK, MALAYSIA 17 OKTOBER 2018

Site 2 for current radio telescope:

UPSI



19 OCTOBER 2016

SEMINAR FALAK NUSANTARA 2018 TANJUNG MALIM, PERAK, MALAYSIA 17 OKTOBER 2018

SOLAR BURST ANTENNA ARRAY (30-70 MHZ) – WITH YNAO, CHINA



HWDA ARRAY AT UM OBSERVATORY

SEMINAR FALAK NUSANTARA 2018 TANJUNG MALAIM, PERAK, MALAYSIA 17 OKTOBER 2018

LOW FREQ SOLAR BURST ANTENNA ARRAY (<40 MHZ) – WITH ITALY-EGYPT

RDF ANTENNA AT JELEBU



SCIENTIFIC RESEARCH PAPERS

Are Neutralinos the Origin of Radio Halos in Galaxy Clusters?

Kiew C.Y.¹, Hwang C.Y.², Kuo P.H.² and Zamri Z. Abidin¹

Study of seismic activity during the ascending and descending phases of solar activity

Indriani Sukma - 2

Abstract. The study of the seismic activity from that covers the major portion of the solar cycle (M<5) and USGS databases (M>5) and large (M>7) variation of earthquake phases of solar cycle. It is suggested that there is a seismicity in these phases for earthquakes to occur can be explained by the storm index during the

Keywords: Solar Activity, PACS 91.30.Px, 96.60

1 Introduction

The sun is magnetically active. Sunspot, Coronal Mass Ejection (CME), and Solar Wind (SW) are the most prominent features of the solar activity.

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Indriani N.¹

Star Formation Rate and Stellar Contribution in Spiral and Elliptical Galaxies at 12 and 22 microns

Galaxies at 12 and 22 microns

Dark Matter

Abstract
We studied the mass distribution of dark matter in the Milky Way and other galaxies. We found that there is a significant amount of dark matter in the inner regions of galaxies. The possible origin of dark matter is inferred from the Solar System. The discovery of a cuspy dark matter halo in the Solar System is a challenge to the Newtonian Dynamical model. The discovery of dark matter in galaxies is a challenge to the Newtonian Dynamical model.

Keywords: cosmology, dark matter, galaxies, Solar System

1 INTRODUCTION

The discovery of dark matter in galaxies is a challenge to the Newtonian Dynamical model. The discovery of dark matter in galaxies is a challenge to the Newtonian Dynamical model.

Received: 16 October 2018
Accepted: 10 May 2019
Published: 01 June 2019

High Speed Data Transmission Performance Evaluation towards Establishing a Malaysia-China Real-Time e-VLBI Network for Radio Astronomy

Zamri Zainal Abidin¹, Lim Yang Wei^{1,2}, Chen Zhong³, Shaiful Jalilari Hashim² and Zulfazli Rosli¹

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² Computer and Communication Systems Engineering Department, University Putra Malaysia, 41400, Serdang, Selangor, Malaysia

³ Shanghai Astronomical Observatory, 80 Nandan Road, Shanghai 200030, China

Abstract The coverage of the current VLBI network between Australia northern Asia will be significantly enhanced with an existence of a middle baseline VLBI station located in Malaysia.

This paper investigates the connecting route of the first half of the Asia-Oceania VLBI network from Malaysia to China. The investigation of transmission network characteristics between Malaysia and China was carried out in order to perform a real-time and reliable data transfer within the e-VLBI network for the future eVLBI observation. MyREN (Malaysia) and CSTNET (China)

high-speed research networks are utilized for this proposed e-VLBI connection. Preliminary network test was performed by ping, traceroute, and iperf prior to data transfer tests, which were

Keywords: Fitting, gradient method, galaxies, dwarf spiral, rotation curve, dark matter

FUTURE

- Joint goals with South East Asia Astronomy Network (SEEAN) WG Radio Astronomy:
 - Spectrum Management, Dark Matter, OH Masers, Pulsars and Black Holes
- Joint Radio Telescope Networking (i.e. linking more than one radio telescopes)
 - Together with established radio astronomical institutes from China, Korea, Japan, Australia, Thailand, Indonesia
- East Asia Observatory (EAO) Observer
 - JCMT (15-m IR-Micro)
 - Subaru (8.2-m IR-Optical)
 - SMA (8x6-m Radio)

RADIO TELESCOPES IN SEA



BEST METHOD FOR JOINT-RESEARCH (e.g. SEAN)

The screenshot shows the website for the Publications of the Astronomical Society of Australia. At the top, there are navigation links for 'New Content Alerts', 'Journal Widget', and 'RISQ'. Below this, the page title is 'Publications of the Astronomical Society of Australia' followed by 'Publications of the Astronomical Society of Australia / Volume 30 / 2013, e047 (10 pages)'. The copyright information states 'Copyright © Astronomical Society of Australia 2013; published by Cambridge University Press' and the DOI is 'http://dx.doi.org/10.1017/pasa.2013.25 (About DOI)'. The article is dated 'September 2013'. A 'Table of Contents - Volume 30 - 2013' section lists 'Buy This Article' for '\$45.00 / £30.00 / €45.00' and 'Request Permissions'. Below this, it says 'NASA ADS Abstract Service' and '0 Comments'. The main article title is 'Investigation on the Frequency Allocation for Radio Astronomy at the L Band' by 'Z. Z. Abidin^{a1}, R. Umar^{a1,a2}, Z. A. Ibrahim^{a1}, Z. Rosli^{a1}, K. Asanok^{a3} and N. Gasiprong^{a4}'. The authors' affiliations are listed below: ^{a1} Department of Physics, Faculty of Science, University of Malaya, 50603, Kuala Lumpur, Malaysia; ^{a2} Astronomy Unit, Universiti Sultan Zainal Abidin, 21300 Kuala Terengganu, Malaysia; ^{a3} Department of Physics, Faculty of Science, Khon Kaen University, 40002 Khon Kaen, Thailand; ^{a4} Department of Physics, Ubon Ratchathani University, 34190 Ubonratchathani, Thailand. Navigation buttons for 'Previous Abstract' and 'Next Abstract' are visible at the bottom of the article content area.

TERIMA KASIH

Thank You

<http://fizik.um.edu.my/elektronik/radio/>

zaa@um.edu.my

