

# SPACE WEATHER AND SPACE DEBRIS AWARENESS IN INDONESIA

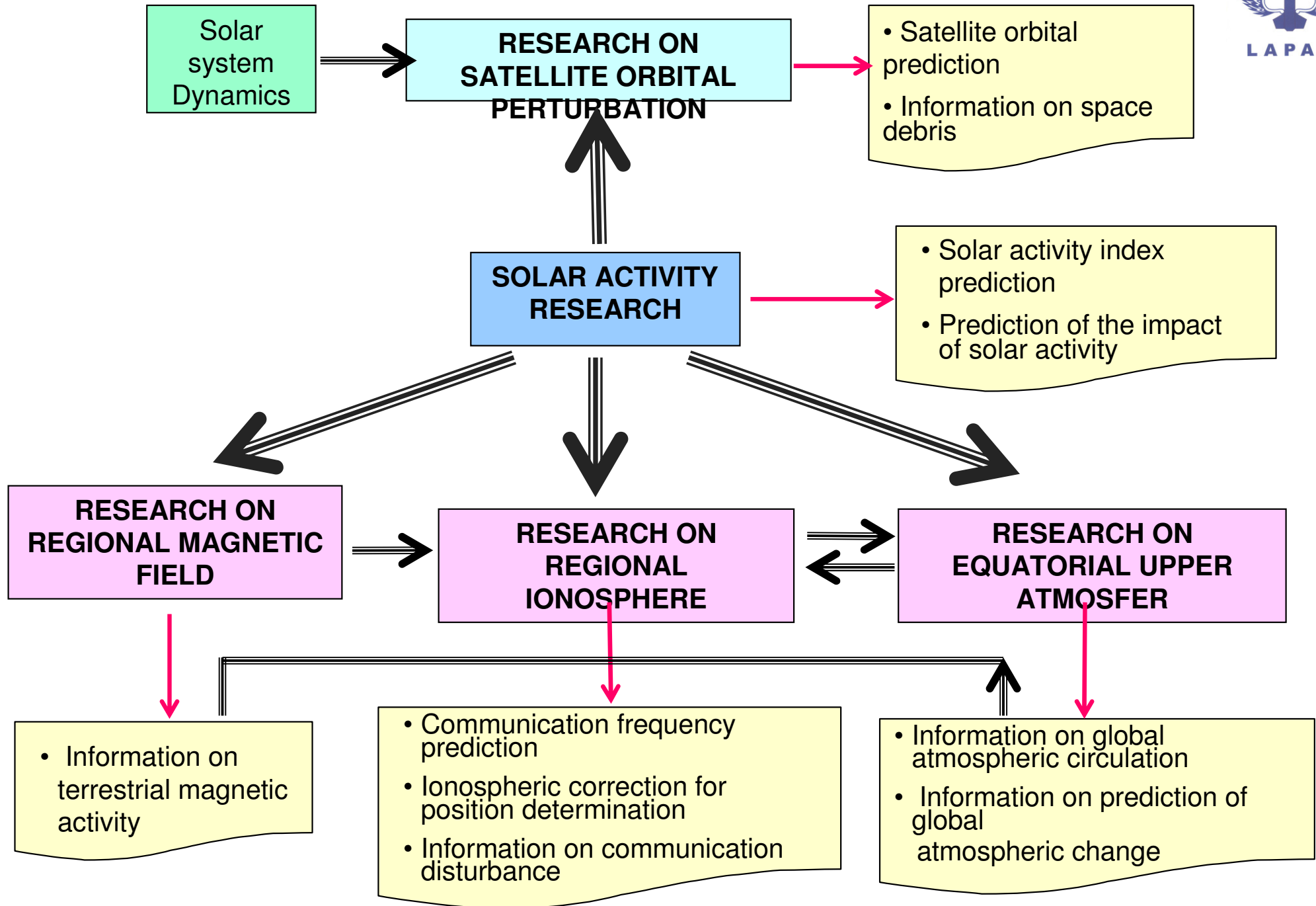
Clara Y. Yatini

National Institute of Aeronautics and Space  
(LAPAN)  
INDONESIA

# Space Weather

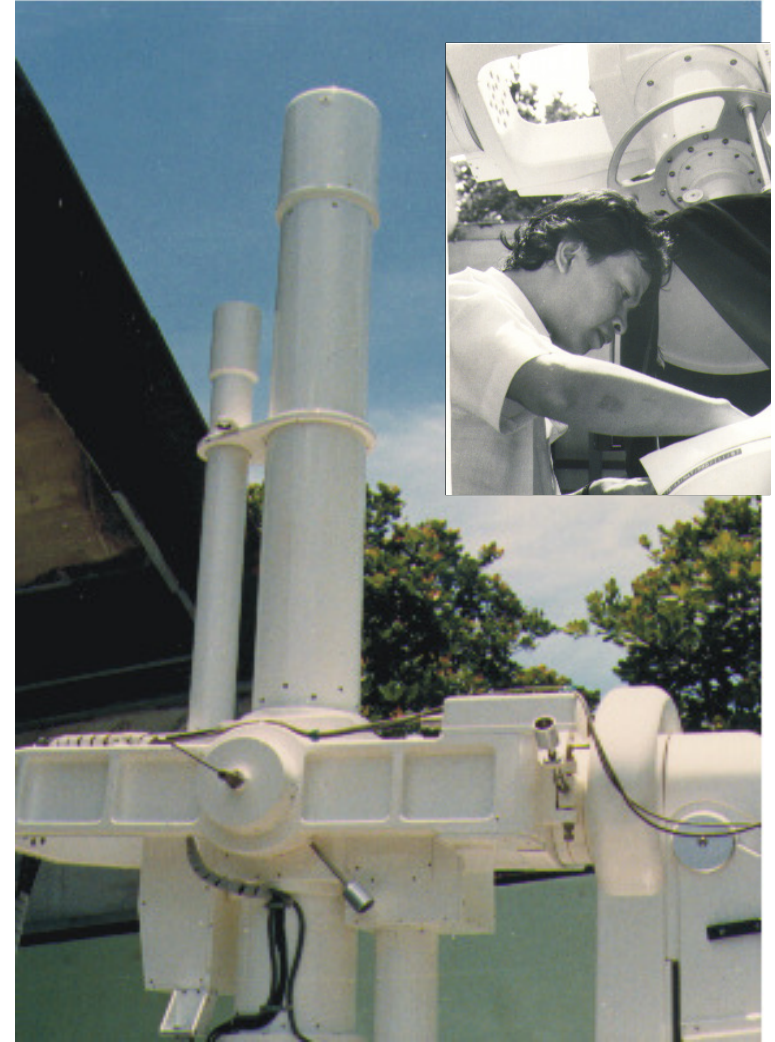
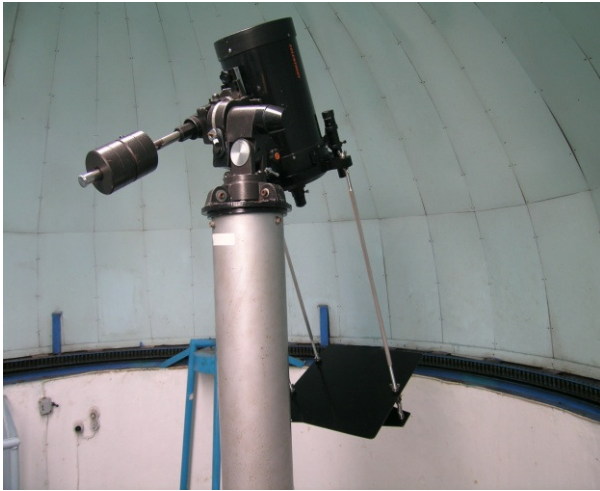
- The Sun
- Interplanetary space
- Magnetosphere
- Ionosphere

# PROGRAMME INTEGRATION



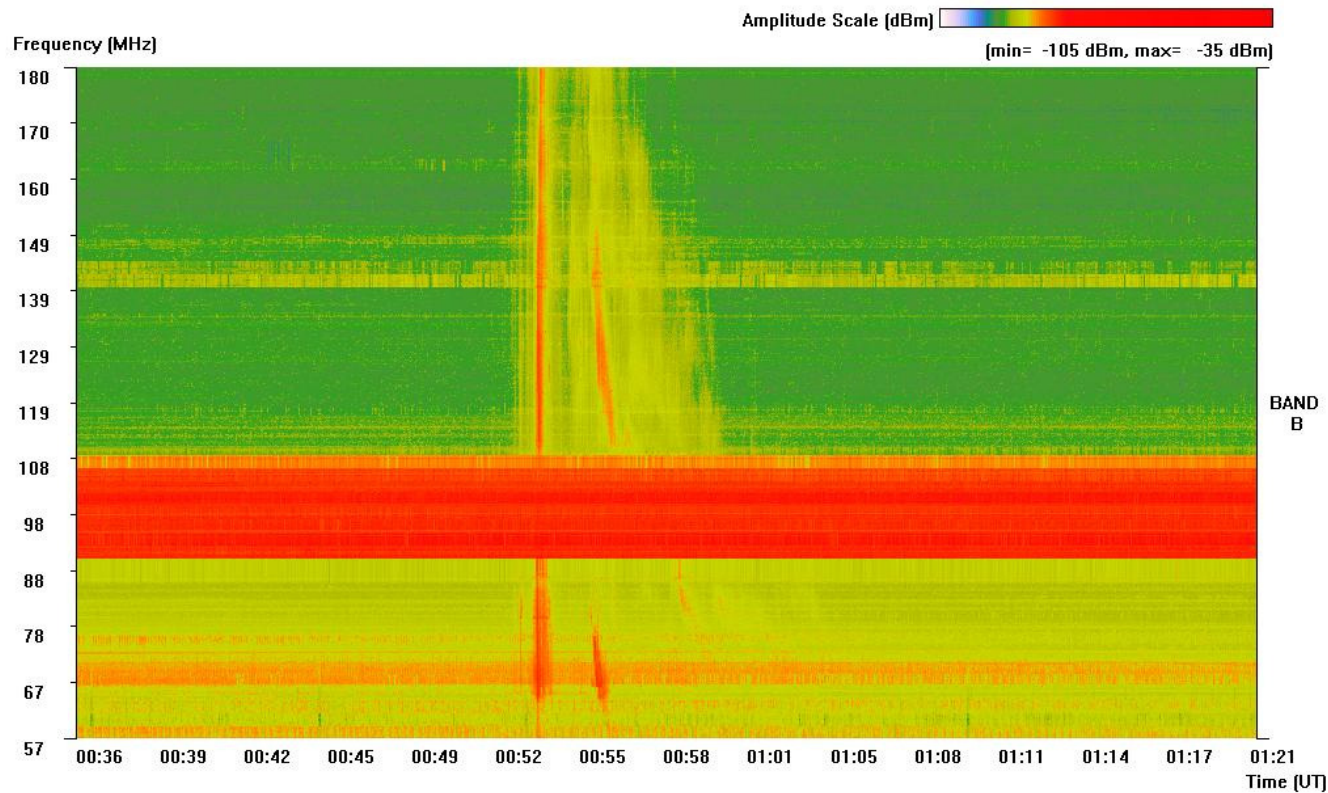
# **SOLAR ACTIVITY RESEARCH AND OBSERVATION**

- **Long term solar activity prediction and the identification of the nature and mechanisms of flares, CMEs, etc.**
- **Preliminary model and the prediction of the impact of solar activity to the Earth (Sun-Earth connection), including the geoeffective solar activity and its impact on ionosphere, geomagnetic field, climate parameters, and satellite's anomaly and perturbation**
- **Ground based solar observation**
- **Information of solar activity**





**SOLAR RADIO  
SPECTROGRAPH -  
SN 4000  
RADIO SPECTRUM :  
18 MHz – 1.8 GHz  
OPERATING NOW:  
56 MHz – 1.8 GHz**



**Solar Radio  
Burst on 12 June  
2010**



# Informasi Pengamatan Cuaca Antariksa

## Lembaga Penerbangan dan Antariksa Nasional

[Home](#)

[Aktivitas Matahari](#)

[Dampak Aktivitas Matahari](#)

[Karakteristik Matahari](#)

[Siklus Matahari](#)

[Pengamatan Matahari \(Live\)](#)

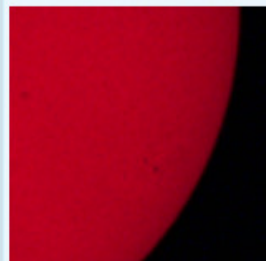
### Links

- > [NOAA](#)
- > [Spaceweather](#)
- > [IPS](#)
- > [SOHO](#)
- > [Exploratorium](#)
- > [Boscha ITB](#)
- > [SIDC](#)
- > [SWPC](#)
- > [NICT](#)
- > [ESA](#)
- > [SolarCycle24](#)
- > [ISES](#)

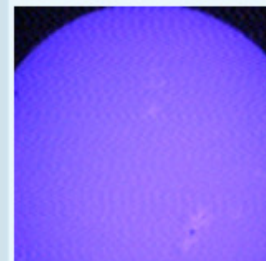
### Counter

Hit counter:  
**9147**  
Users online:

### Pengamatan Matahari



Teleskop H alpha

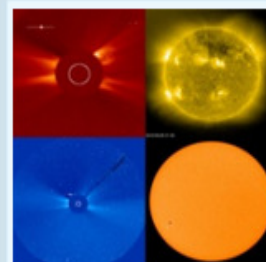
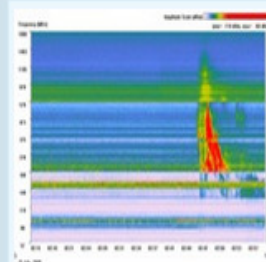
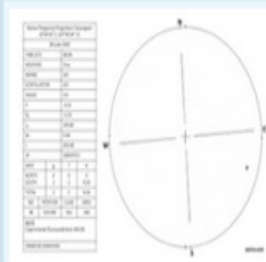


Teleskop Cak



Teleskop White Light

### Pengamatan Sunspot



### Informasi dan Berita

#### Cuaca Antariksa

24 November 2010

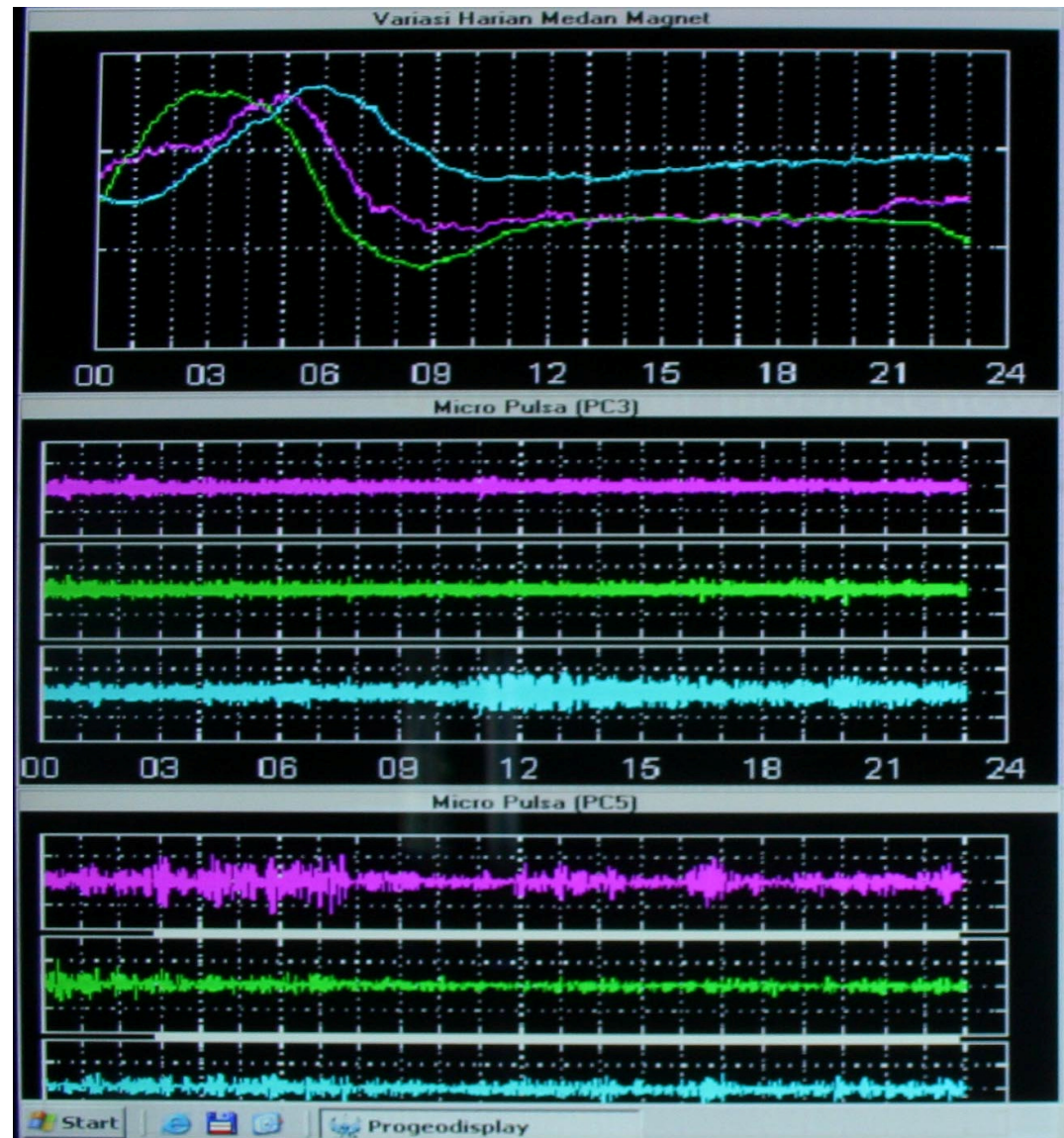
Cuaca antariksa menggambarkan kondisi di antariksa yang meliputi kondisi pada matahari, angin surya, magnetosfer, ionosfer, dan termosfer.

# **GEOMAGNETISM AND MAGNETOSPHERE**

- **DEVELOPMENT OF REGIONAL MAGNETIC FIELD MODELLING**
- **GEOMAGNETIC ACTIVITY MONITORING**
- **GEOMAGNETIC ACTIVITY PREDICTION MODEL**
- **INFORMATION ON GEOMAGNETIC DISTURBANCE (MICROPULSE, K INDEX) AND INFORMATION ON CHARACTERISTICS OF GEOMAGNETIC PERIODICITY**



# Biak, Pontianak, Sumedang, Kototabang Manado, Parepare, Kupang

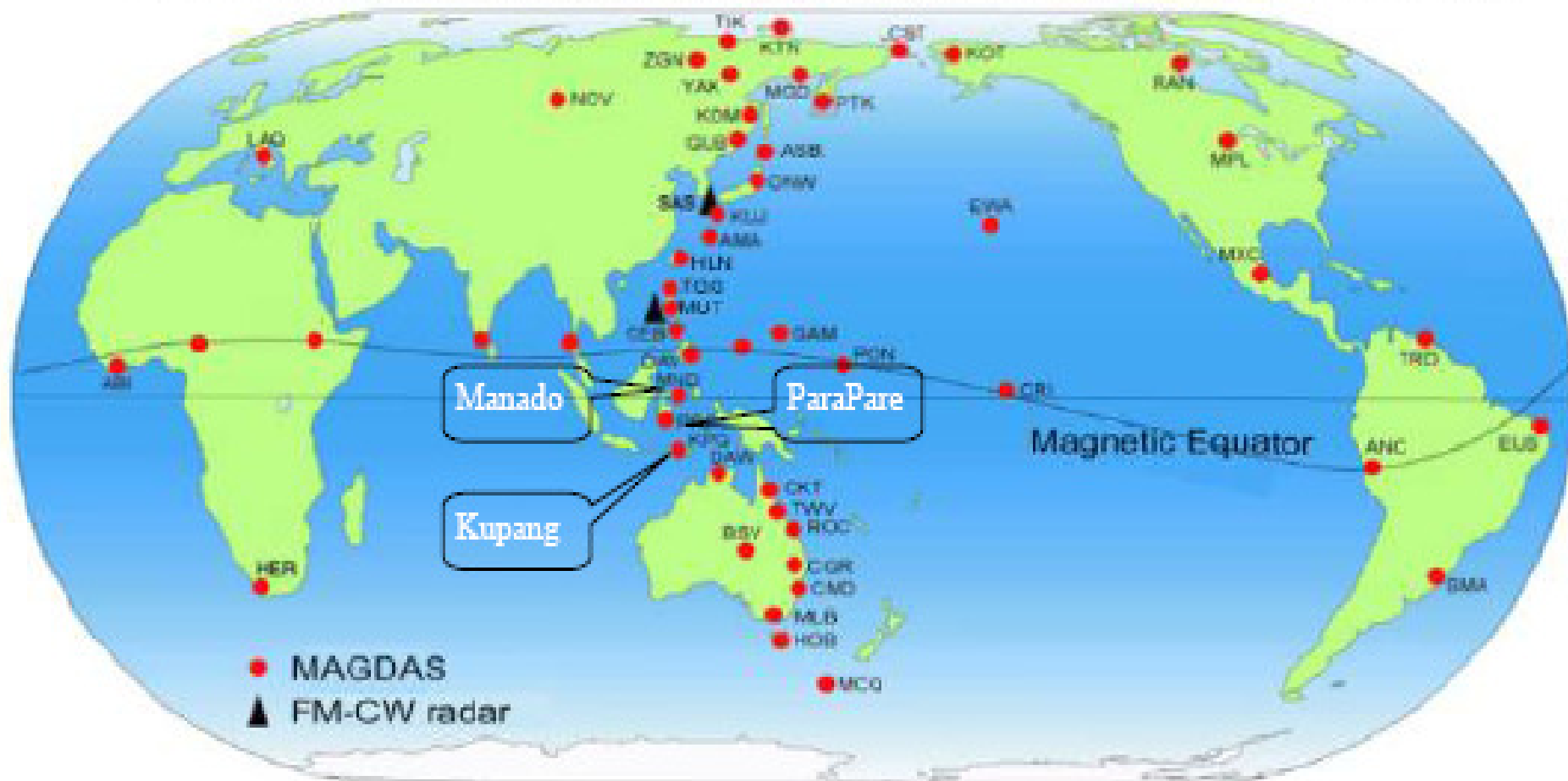


# MAGDAS Network in Indonesia

(Magnetic Data Acquisition System)

## MAGDAS/CPMNN

(MAGnetic Data Acquisition System/Circum-pan Pacific Magnetometer Network)

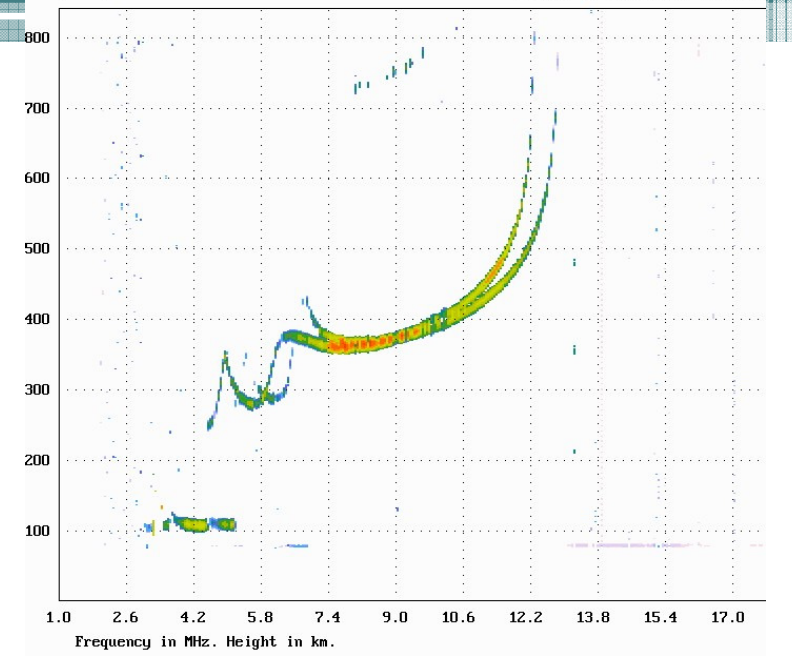


# **IONOSPHERIC AND UPPER ATMOSPHERIC RESEARCH**

- **IONOSPHERIC DISTURBANCES ON SATELLITE COMMUNICATION AND POSITION DETERMINATION (SCINTILLATION, TEC, INTEGRATION ON DISTURBANCES IN SOLAR ACTIVITY AND GEOMAGNETIC)**
- **MODEL AND METHOD ON IONOSPHERIC PARAMETER PREDICTION OF INDONESIAN REGIONAL IONOSPHERE**
- **STUDY ON EQUATORIAL (INDONESIA) SCINTILLATION AND REGIONAL TOTAL ELECTRON CONTENT (TEC) MODELLING**
- **HIGH FREQUENCY (HF) COMMUNICATION PREDICTION SERVICE, PREDICTION AND REAL TIME RADIO FREQUENCY MANAGEMENT SYSTEM**
- **STUDY ON SEASONAL VARIABILITY OF WAVES AND WAVES INTERACTION**
- **MODELLING OF REGIONAL DYNAMICAL UPPER ATMOSPHERE OVER INDONESIA (GRAVITY WAVE, DISTURBANCE PROPAGATION, NEUTRAL WIND, PERIODICITY ANALYSIS ON ATMOSPHERE )**



KEL IPS-71 : Sumedang, Indonesia. Tue Nov 6 (310) 2001 07:58 UT  
 REOSPRICE Tue Nov 6 (310) 2001 14:58 LT

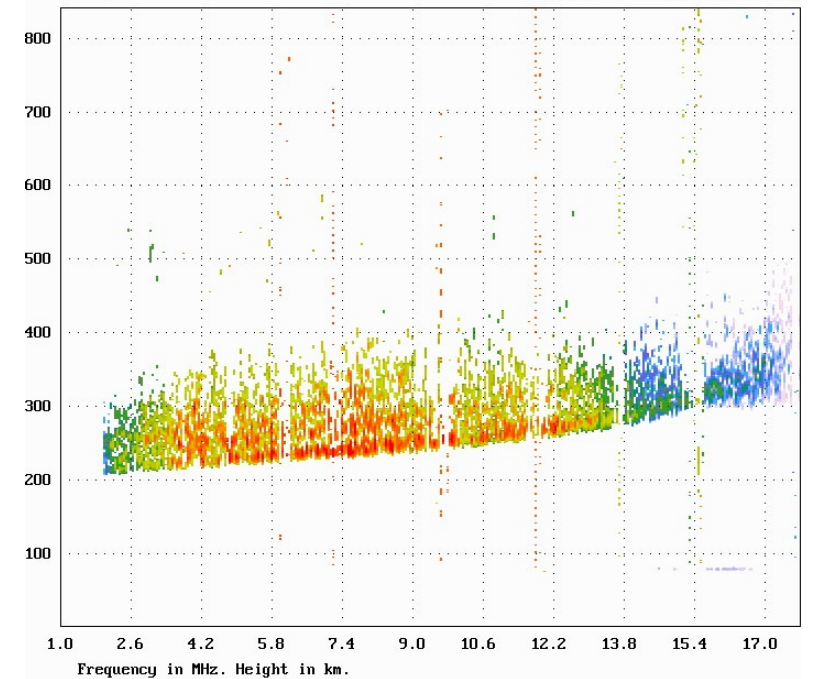


Hasil runing model GISM

Hasil plot Model Indeks sintilasi S4

Hasil plot Model TEC

KEL IPS-71 : Sumedang, Indonesia. Fri Nov 9 (313) 2001 15:58 UT  
 REOSPRICE Fri Nov 9 (313) 2001 22:58 LT



# INSTRUMENTATION NETWORK

## SOLAR, SPACE DYNAMICS, DAN ATMOSPHERE OBSERVATION

### KOTOTABANG:

EAR, RASound,  
MWR, Airglow,  
Ceilometer, ComSys,  
AWS, ORG,  
Ionosonda

### PONTIANAK:

NPR, ISM,  
Magnetometer, AWS, NPR

### MANADO :

Ionosonda, TEC,  
Magnetometer  
Magdas

### BIAK:

Ionosonda,  
Magnetometer,  
WPR, BLR

### SUMEDANG :

Teleskop, Ionosonda,  
Radio Spektrograf,  
TEC meter, AWS,  
Airglow Monitor

### PAMEUNGPEUK:

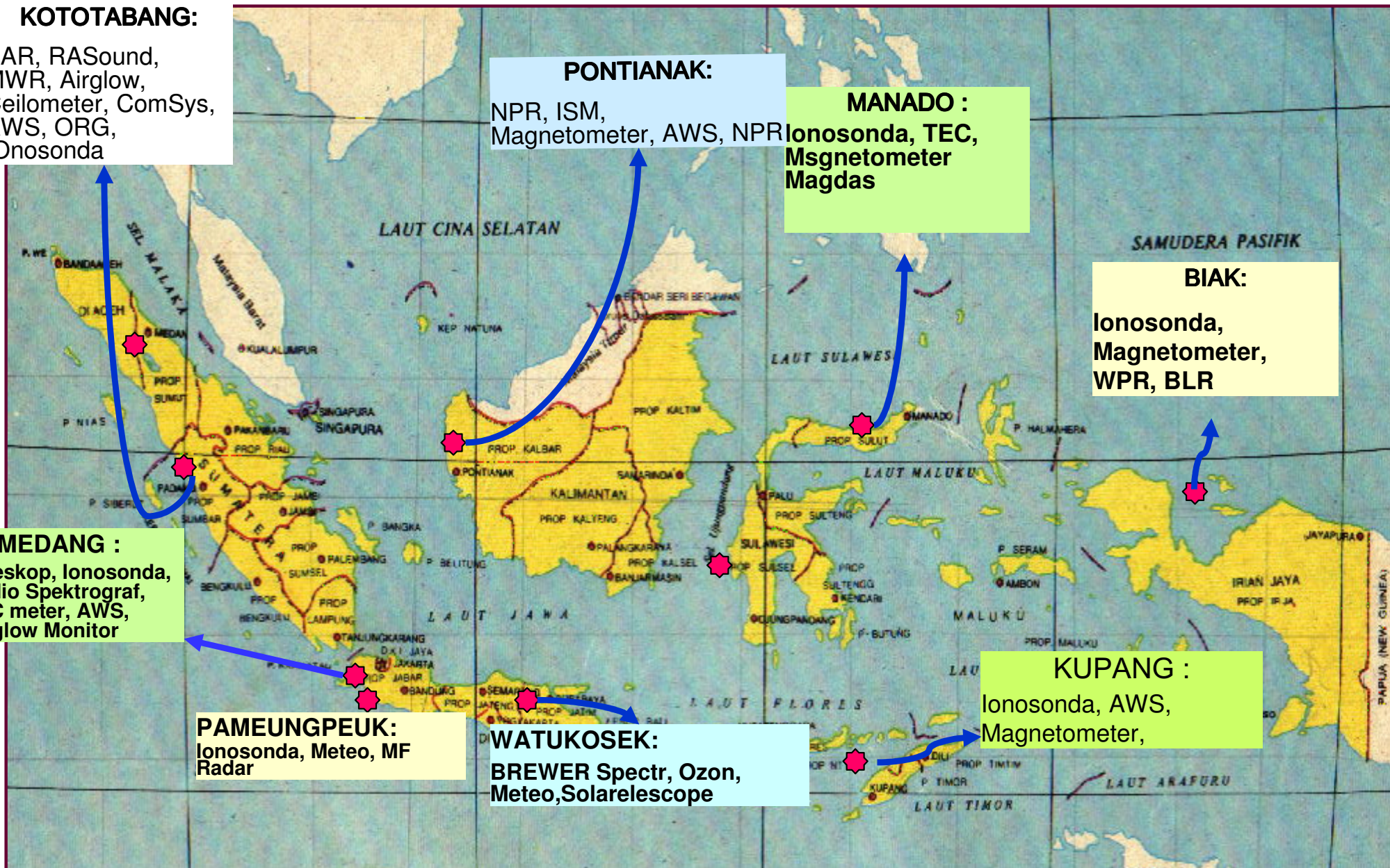
Ionosonda, Meteo, MF  
Radar

### WATUKOSEK:

BREWER Spectr, Ozon,  
Meteo, Solarescope

### KUPANG :

Ionosonda, AWS,  
Magnetometer,



# DEVELOPING SPACE WEATHER EARLY WARNING SYSTEM

Observation and Information of Space Weather.

Needs:

- Real time solar data
- Real time space-based interplanetary space data
- Knowledge in predicting the solar activity
- Knowledge in predicting the space weather and its impact


Collaboration between researchers, and technical training (Sun and Sun-Earth connection)

- NICT Japan, IPS Australia (Asia Oceania Space Weather Alliance)





HOME  
WEBMAIL  
WEBMASTER



LAPAN

• EDUKASI • SITEMAP • SITUS INTERNAL • LAPAN DIREKTORI

- INFORMASI**
- DEPAN
  - GALERY GAMBAR
  - BERITA DIRGANTARA
  - AGENDA KEGIATAN
  - ORGANISASI
  - RENSTRA
  - TEKNOLOGI PENGAMATAN

- S. P. D**
- Tanjung Sari
  - Pameungpeuk
  - Watukosek
  - Pontianak
  - Kototabang
  - Biak

**INFO PENELITIAN**

Pengaruh Sinar Kosmik Terhadap Pembentukan Aw ...  
(06/03/2007)

**COUNTER**

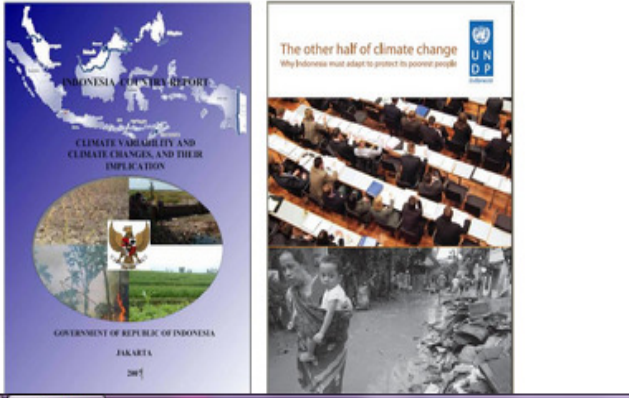
3.361 9

**PROGRAM UTAMA**



**INFORMASI TERBARU**

UNDP dan Perubahan Iklim  
Berikut adalah dokumen mengenai perubahan iklim yang dirilis oleh UNDP Indonesia.



**PENCARIAN**

berita

- RUBRIK**
- Iklim dan Lingkungannya
  - Lingkungan antariksa
  - Teknologi Informasi
  - artikel lainnya

**INFO KEGIATAN**

- Jadwal Presentasi Evaluasi Triwulan III Pusfatsatdim

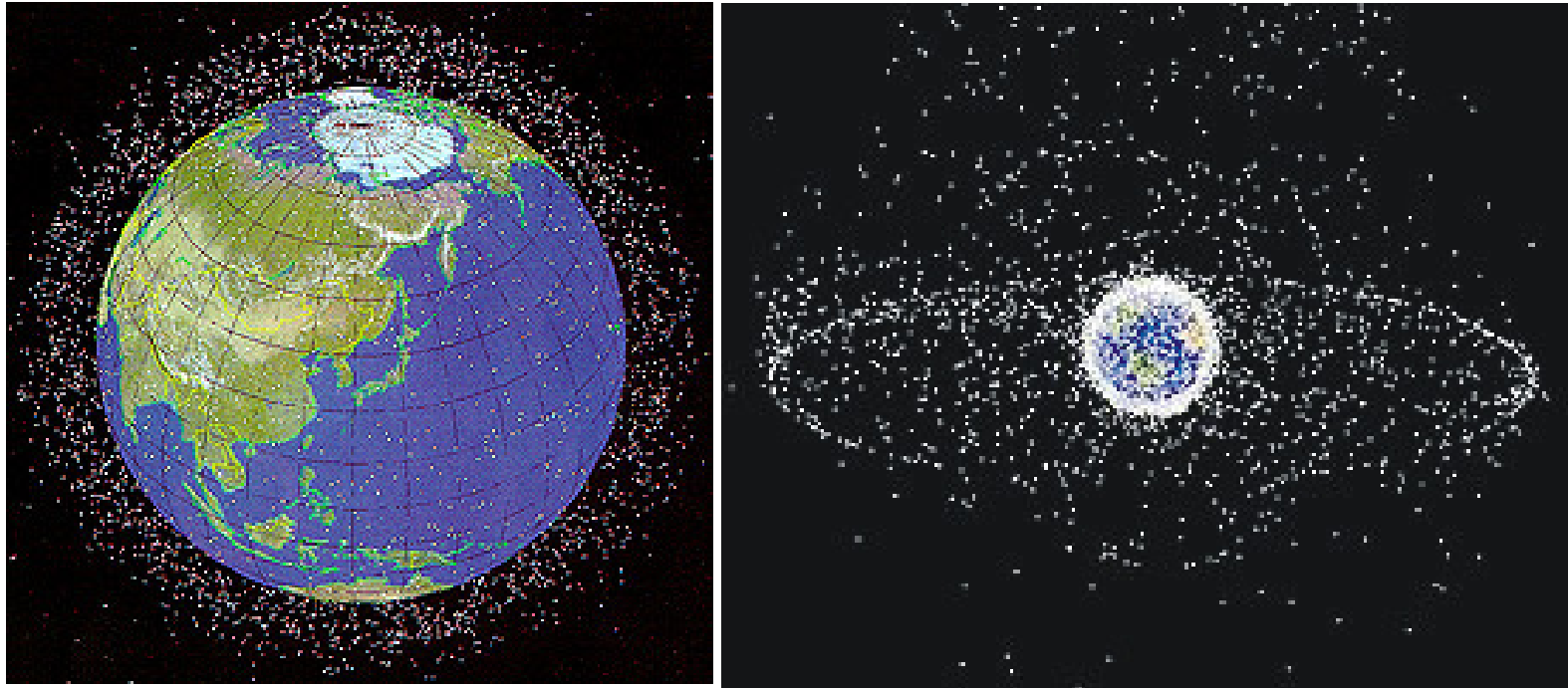
**INFO SEMINAR**

- 2010 International Workshop On Space Weather in Indonesia

- BULETIN**
- Komrad Vol.3 No.2 April - Juni 2011
  - Komrad Vol. 3 No.1 Januari - Maret 2011
  - Komrad Vol. 2 No.4



# SPACE DEBRIS AWARENESS



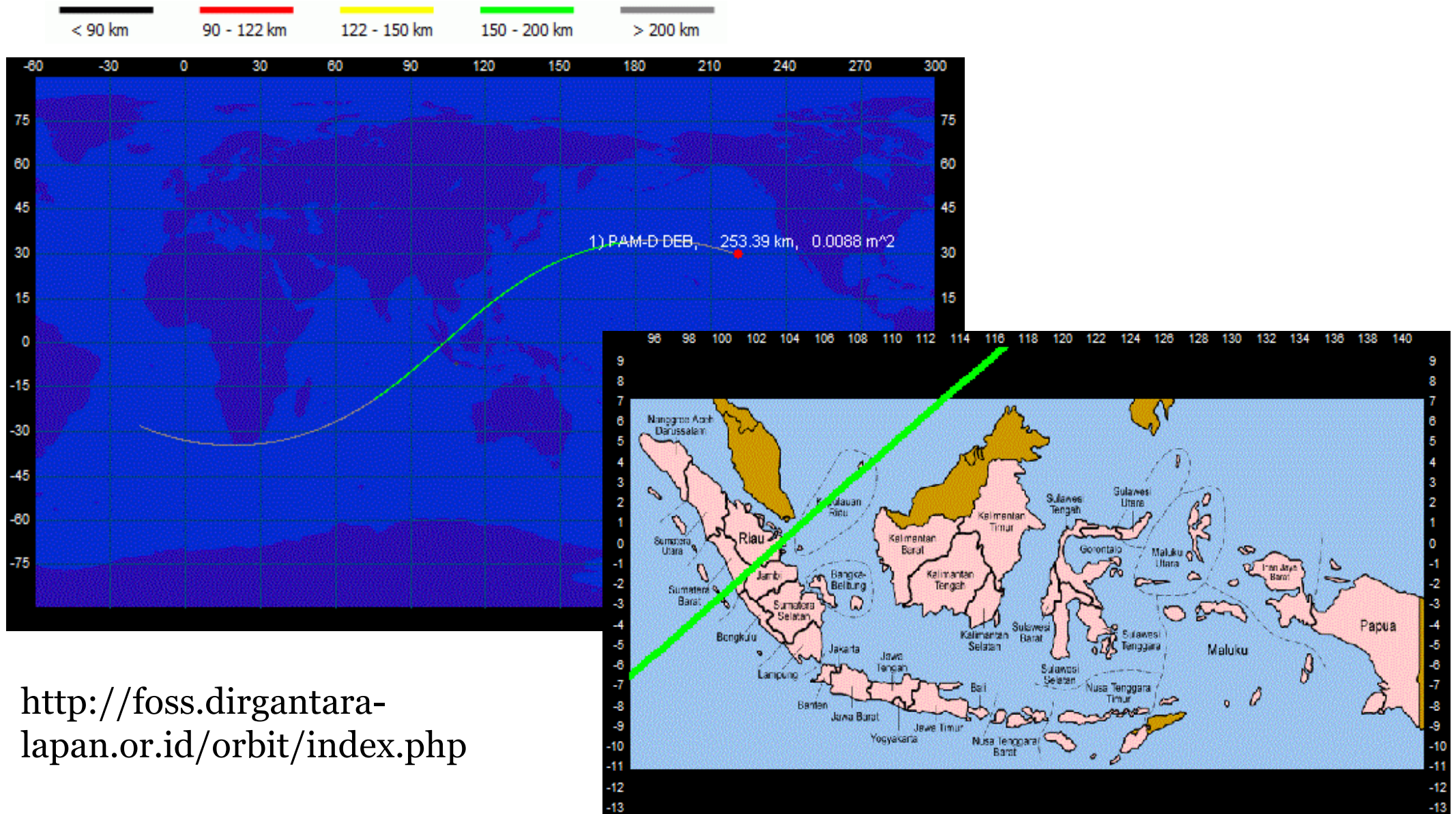
- Research on satellite's orbital perturbation and space debris
- Study of satellite's anomaly (related with the space weather)
- Identification of reentry objects

# Pemantauan benda jatuh antariksa

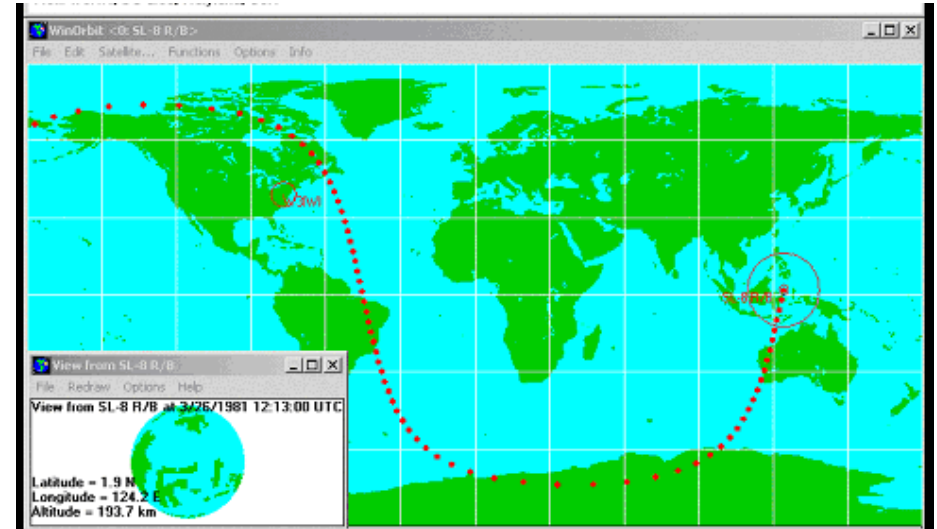
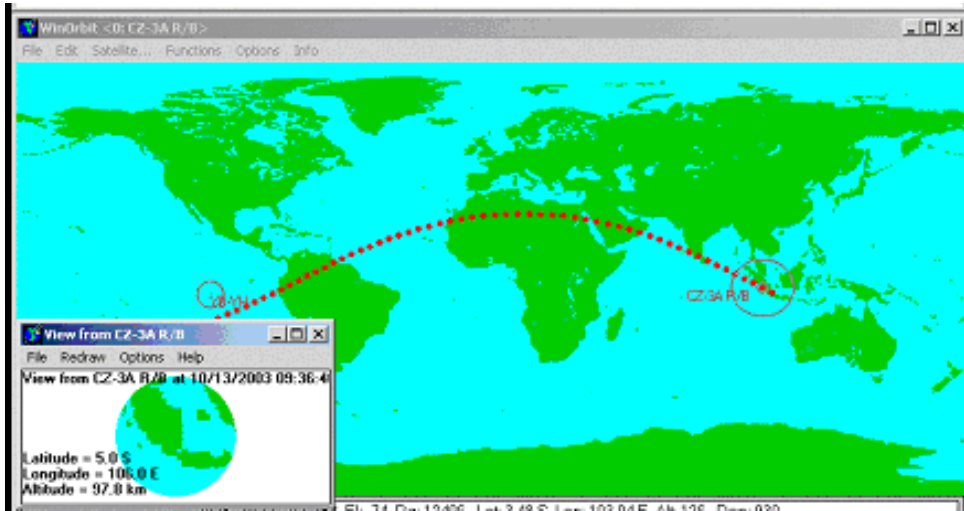


Sejak 1 jam yang lalu hingga 1 jam ke depan sebanyak 1 benda antariksa melintasi Indonesia dengan ketinggian kurang dari 200 km. Pada umumnya suatu benda dikatakan jatuh jika ketinggiannya mencapai 122 km.

*Last update: 2011-06-01 08:06:51 WIB*



# IDENTIFICATION OF REENTRY OBJECTS



**SATELLITE DEBRIS, FALL IN  
BENGKULU OCT. 13, 2003**



**ROCKET DEBRIS, FALL IN  
GORONTALO, MARCH 23,  
1981**

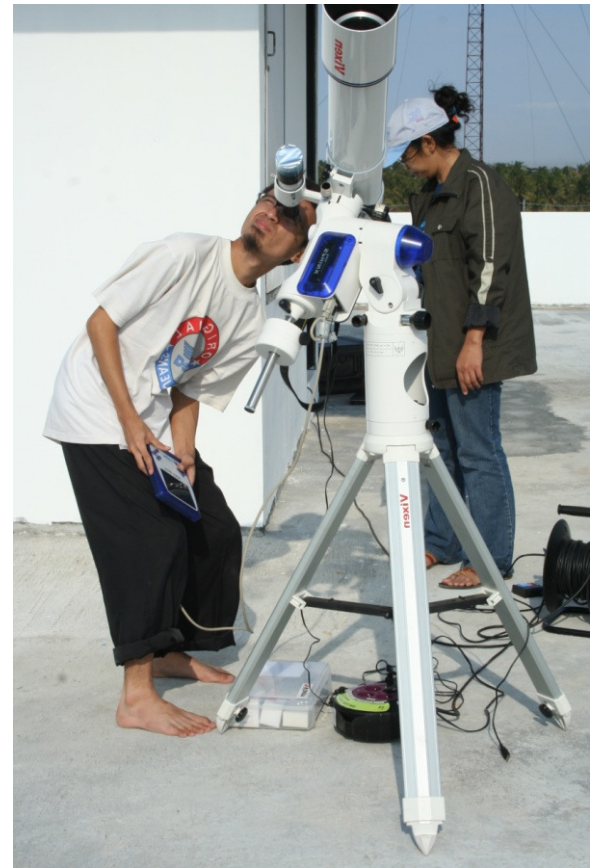
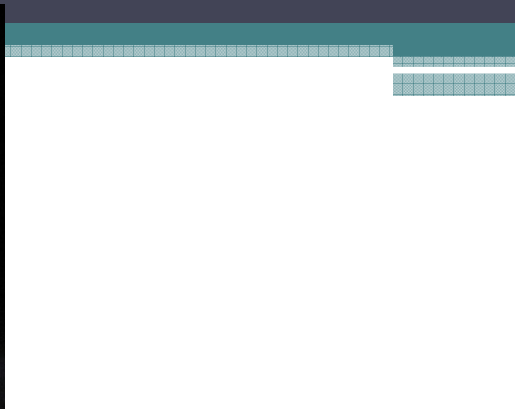
- Information of the reentry objects
- Information System of Reentry Objects

In coordination with Agency for Disaster  
Management and Refugees

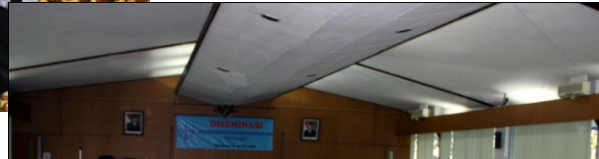
# Space Mindedness

- Public Outreach





- Dissemination





**THANK YOU**