

**East Asian Astronomers Meeting-9 14-17 October, 2013, @NCU, Taiwan**

# **Cooperation in East Asian Astronomy: Past and Future**

*Norio Kaifu (NAOJ)*

## What is EAMA?

- EAMA is an astronomers-based cooperation in EA since 1990
- Core Regions (China, Japan, Korea, Taiwan) + other Asian Countries
- EAMA aims continuous and systematic cooperation

**一衣帶水** : *We are neighbors*

- EACOA was established by EAMA in 2005



**1990 黄山會議**

**Organized by**

**Liu Cai-pin 劉彩品**

**Norio Kaifu 海部宣男**

**(50 from China, Japan, Korea)**



# EAMA Symposiums

- 1990** “Star Forming Regions” Huanshian, **China** (50)
- 1992** “Millimeter-Wave and Infrared Astronomy” Daejon, **Korea**  
(100)
- 1995** “Ground-Based Astronomy in Asia” Tokyo, **Japan** (215)
- 1999** “Observational Astrophysics in Asia and its Future”  
Yunnan, **China** (118)
- 2001** “EAMA Core Meeting” Taipei, **Taiwan** (60)
- 2004** “Asian View of Cooperation in Astronomy” Seoul, **Korea**  
(130)
- 2007** “East Asian Network of Astronomy: Research, Education  
and Popularization” Fukuoka, **Japan** (140)
- 2010** “East Asian Network on Astronomy” Shanghai, **China** (100)
- 2013** “Cooperation on Current and Future Astronomy”  
Jhongli, **Taiwan** (140)

# EAMA Working Policies

- Promote cooperation of astronomy in East Asia
- Promote mutual understanding and exchange
- Promote realistic and effective cooperation
- Organize symposium regularly (once a 3years)
- Organize working groups
- Target: **East Asian Observatory** in future

# 1993 EAMA Site survey for optical & Radio(ALMA) sites

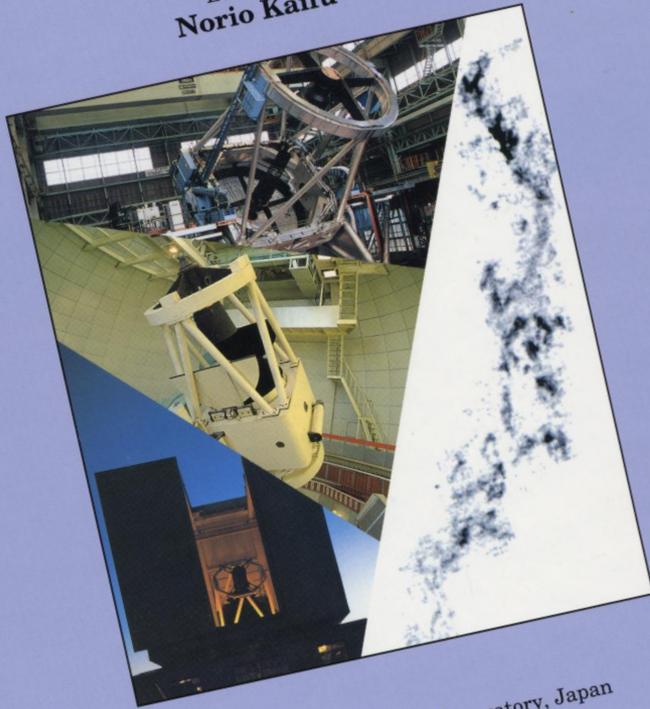


Gobi Desert

Delingha

Third East-Asian Meeting on Astronomy  
**GROUND-BASED ASTRONOMY  
IN ASIA**

Edited by  
**Norio Kaifu**



National Astronomical Observatory, Japan

**1995 EAMA-3 Proceedings**

**with a list of East-Asian  
astronomical institutes  
and Telescopes**

**EAMA-1** 1990

1991

**EAMA-2** 1992

1993

1994

**EAMA-3** 1995

1996

1997

1998

**EAMA-4** 1999

2000

**EAMA-5** 2001 discussion to organize **EAYAM**

2002

2003 ▪ **EAYAM-1**

**EAMA-6** 2004 **EA VN Consortium** established  
(propose **EACOA**) (**EAYAM WG**) (**ALMA**)

2005 ⇒ **EACOA** established

2006 ▪ **EAYAM-2**

**EAMA-7** 2007

2008 ▪ **EAYAM-3**

2009

**EAMA-8** 2010

2011 ▪ **EAYAM-4**

2012

**EAMA-9** 2013

## Products from EAMA

- Many contacts, exchanges and cooperation
- EAYAM: East Asian Young Astronomers Meeting
- EAVN: East Asian VLBI Network (to KaVA, EAVN)
- EACOA: East Asian Core Observatories Association
- Site survey (toward “East Asian Observatory”)
- ALMA Cooperation (to ALMA ARC)
- . . . . .

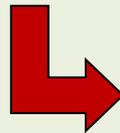
**Present EAMA**



**(Next Step)**  
**EAMA activities with WGs**  
+  
**EA Core Observatories**  
**Association**



**(Intermediate Structure)**  
**United Observatories**  
**Funding Agencies**



**(Future Target)**  
**East Asian Observatory**

# **EACOA**

**Association of East Asian Core Astronomical Institutes**

**Established in 2005**

**based on the proposal by EAMA-6 (2004)**

**MOU by:**

**National Astronomical Observatories of China (NAOC)**

**National Astronomical Observatory of Japan (NAOJ)**

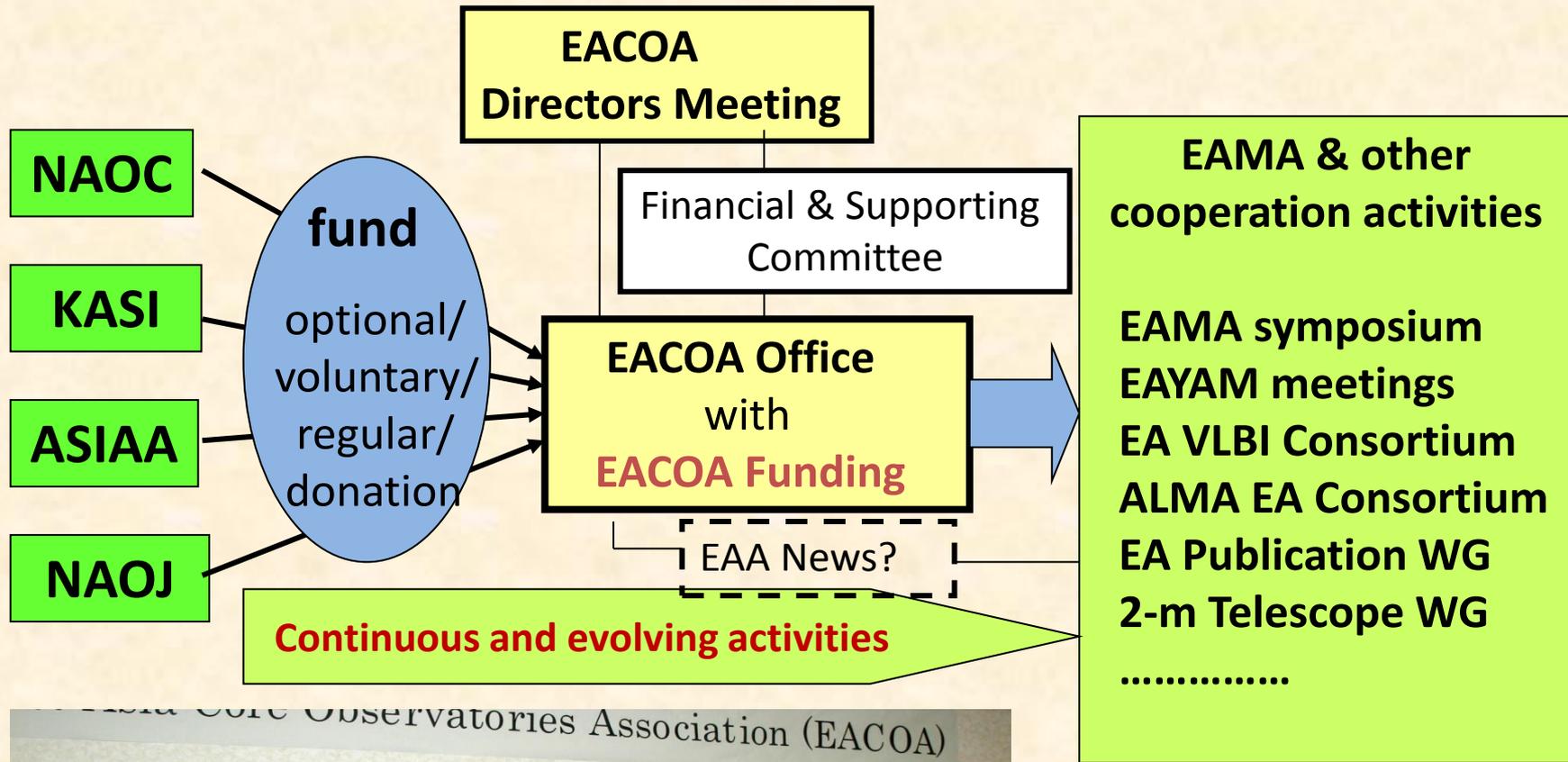
**Korea Astronomical and Space Science Institute (KASI)**

**Academia Sinica Institute of Astronomy and Astrophysics (ASIAA)**

**for**

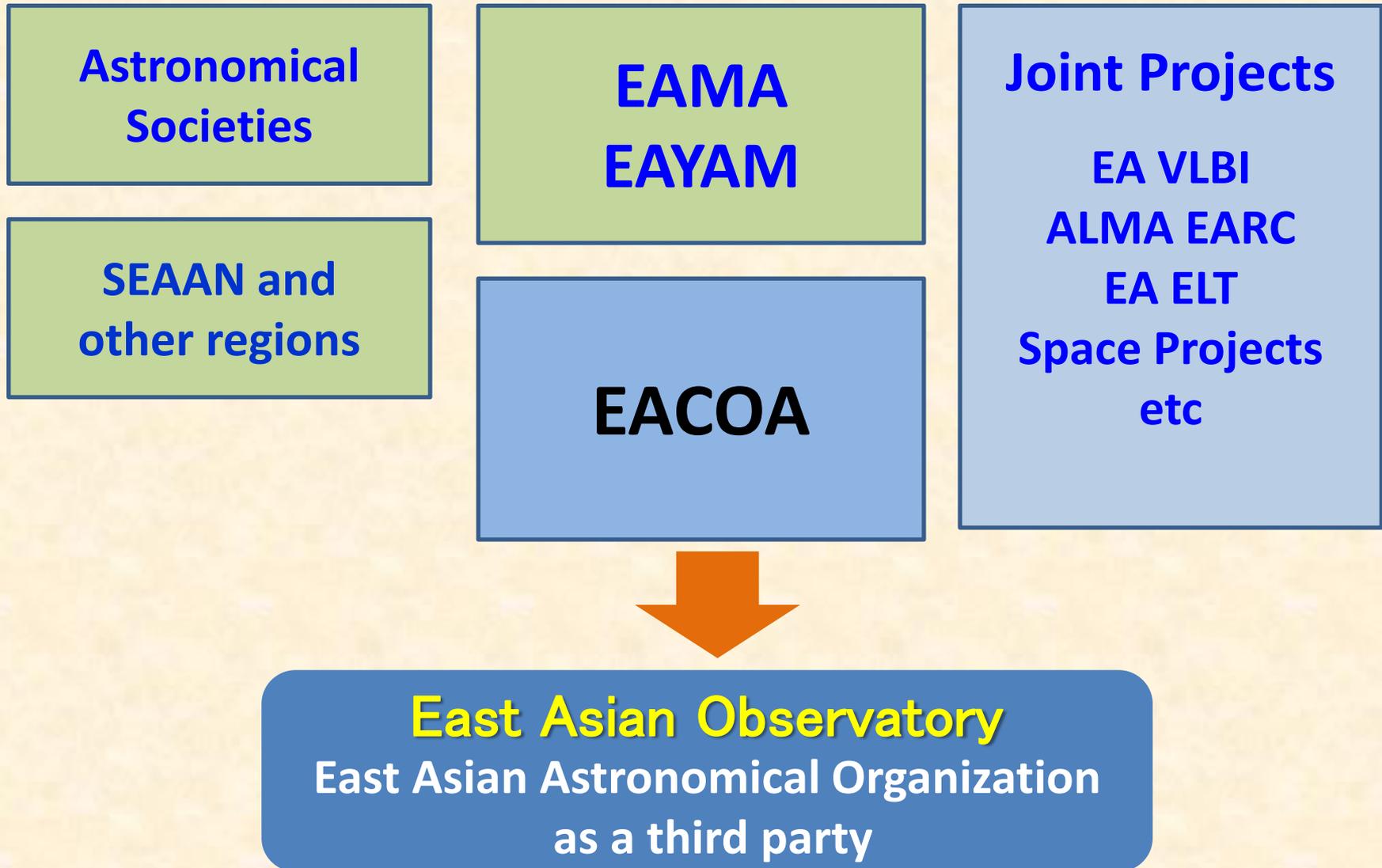
- **Directors' meetings (at least once a year)**
- **Cooperation in EA and future direction/projects**
- **Promotion of sharing resources and exchange in EA**
- **Support of the EAMA and other cooperation activities**
- **“East Asian Observatory” as future target**

# EACOA was established (2005)



**Conclusion of MOU for EACOA at NAOJ**

# Development of East Asian Cooperation in Astronomy (2006, for EACOA-2 by Kaifu)



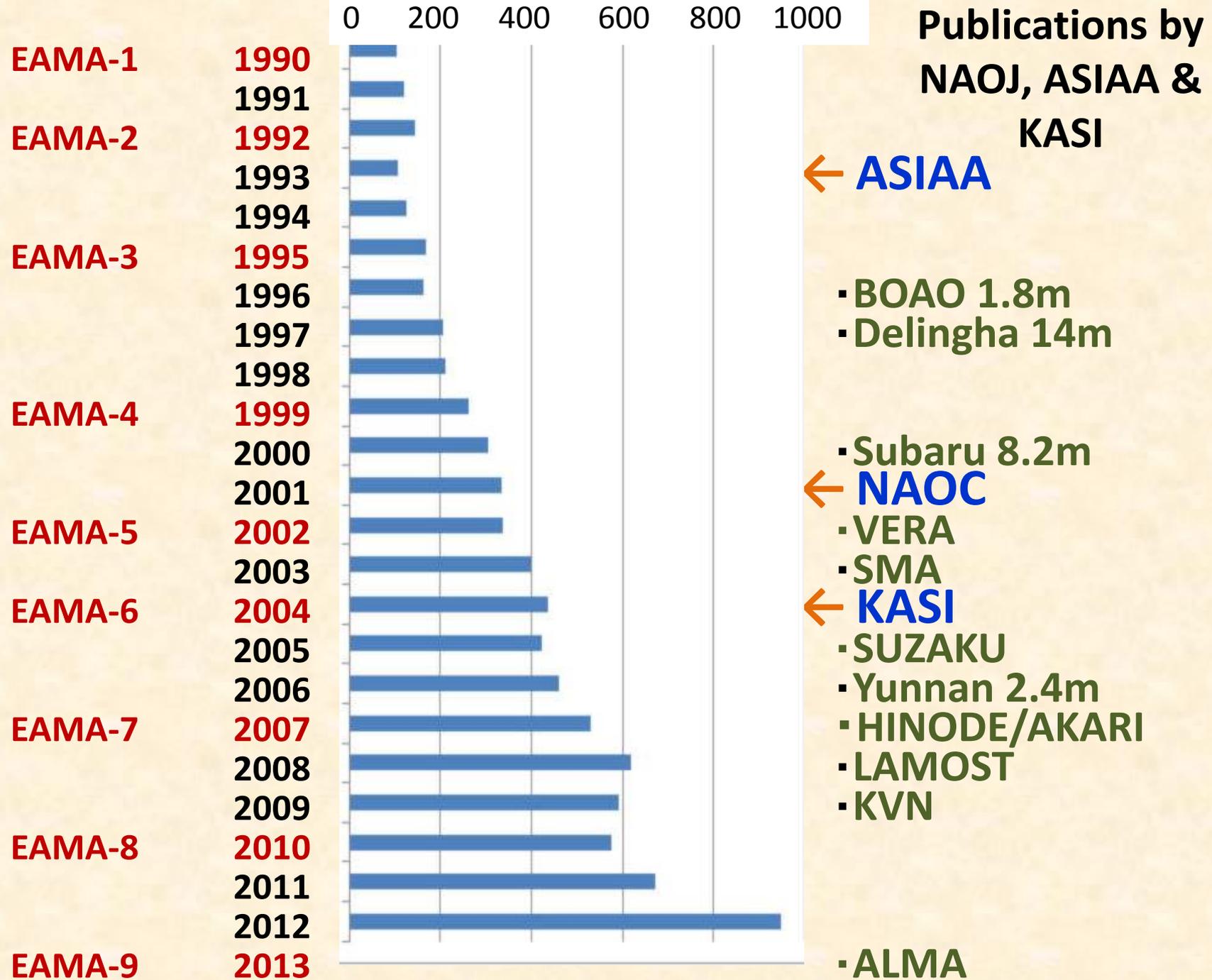
# Future Direction of EAMA and EACOA

## 1: Situation has changed !

**1990 - 2013**

<b>Number of Core Astronomical Institutes:</b>	<b>1 ⇒ 4</b>
<b>Top level Ground-based Telescopes:</b>	<b>1 ⇒ 7</b>
<b>Number of Publications:</b>	<b>x 10</b>

- **Astronomy in East Asian Region was developed dramatically.**
- **Cooperation in East Asian Astronomy is getting more diverse, closer and higher-level.**
- **EACOA is getting more active and important.**
- **Role of EAMA should adapt to above situation.**



# EACOA Initiatives

- ◆ **Site Survey and Development:** Ali Site in China; started 2002?
- ◆ **Joint Funding:** EACOA Fellows (5 year posts); started 2012
- ◆ **Asymmetric Funding:** CSO (90 nights); started 2013
- ◆ **Joint Operations:** JCMT; start 2014?
- ◆ **East Asian Observatory:** Subaru, AMiBA, SMA, CFHT, CSO, TMT (JCMT, UKIRT)

# Future Direction of EAMA and EACOA

## 2: Develop new Observation Sites

(Existing Sites)

**Mauna Kea  
Other Sites**

**Short – Intermediate  
Timescale**

(New Sites)

**Tibet (Ali Region)  
(Polar Regions)**

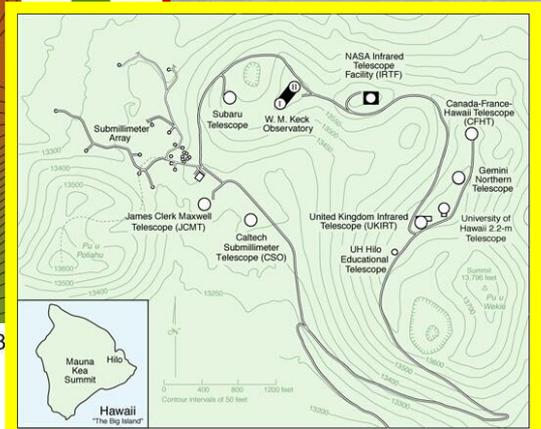
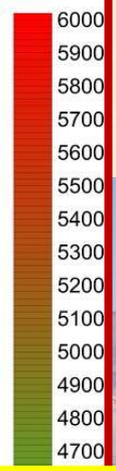
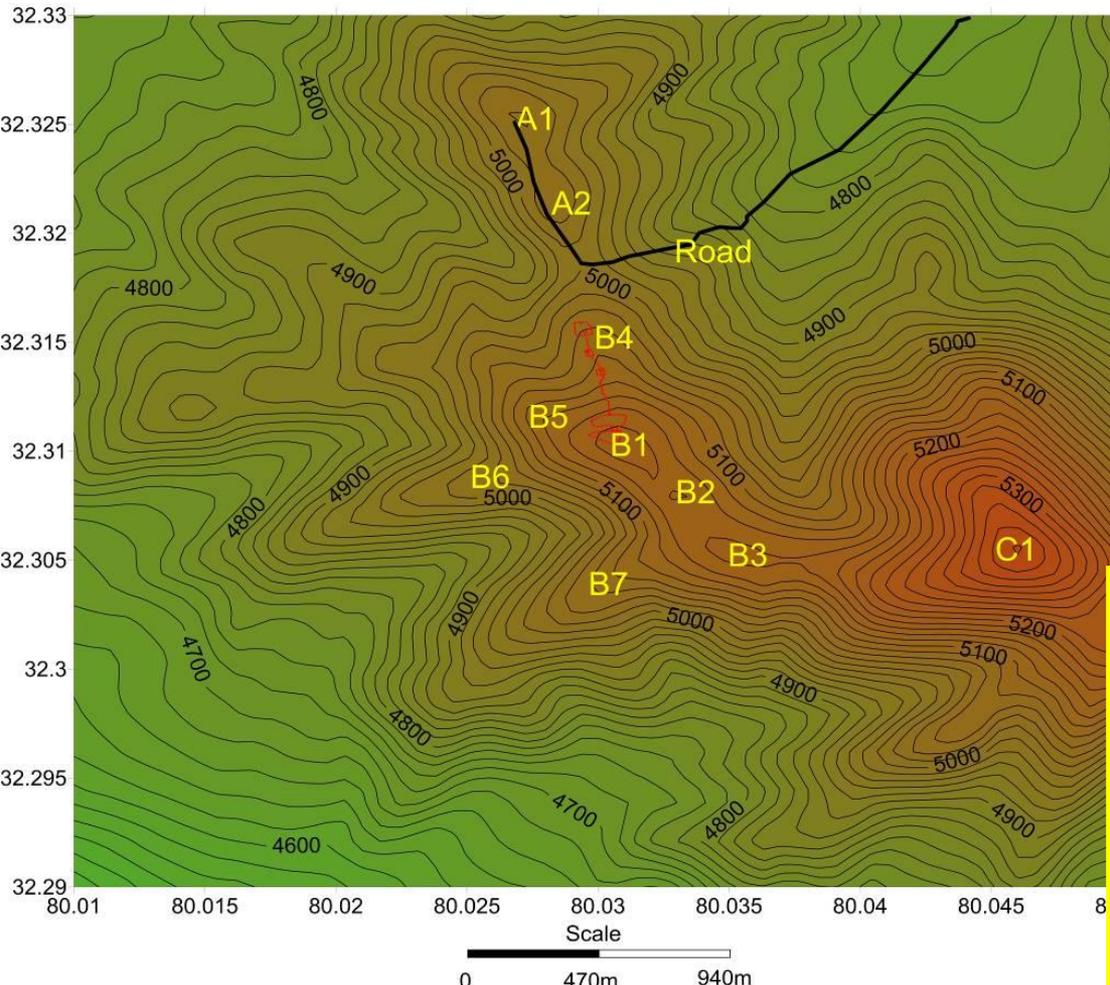
from  
**Small Telescopes  
to  
Higher Level  
Sciences**

**Future East Asian Observatory**



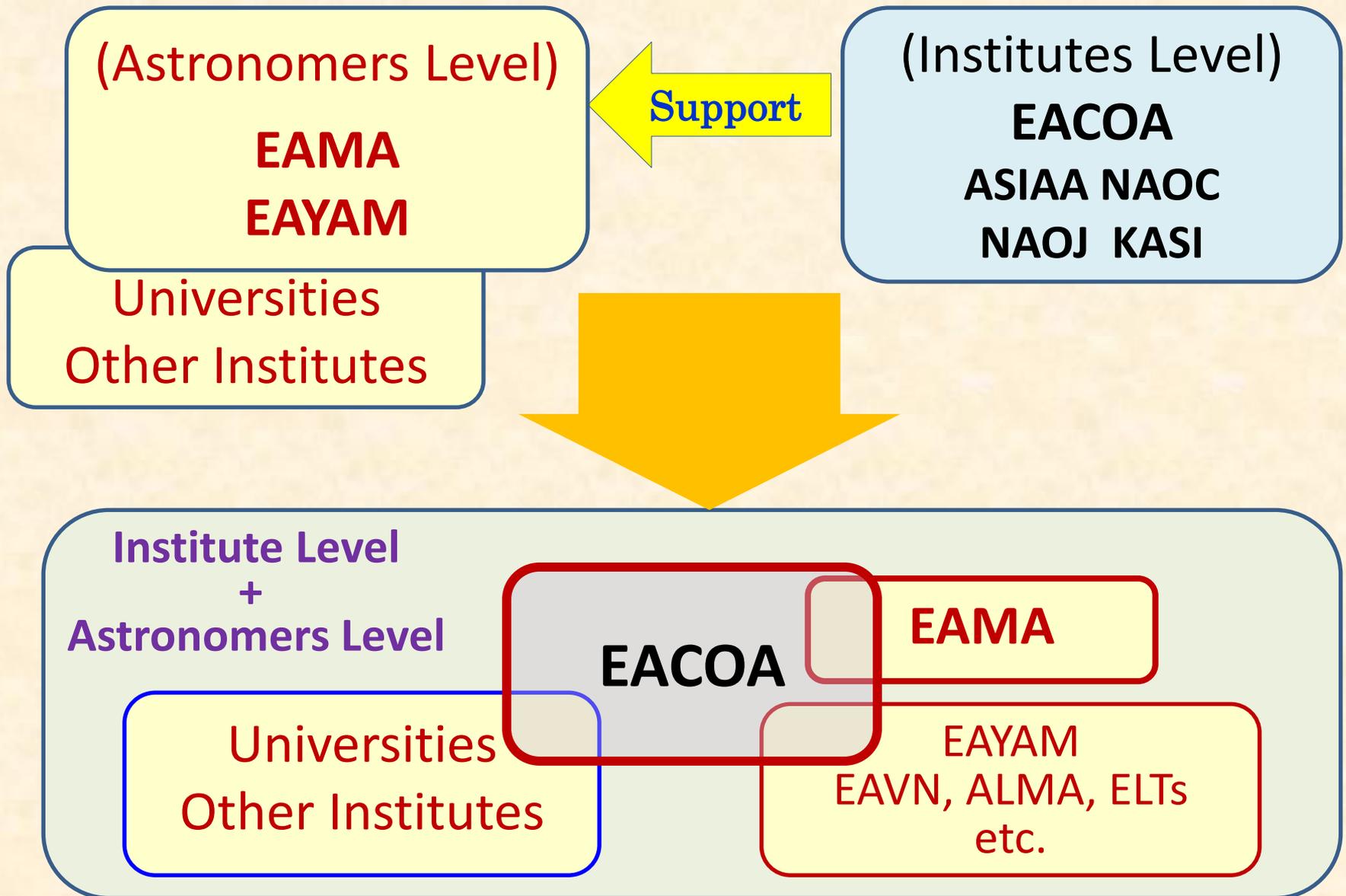
# Ali Site: 5,000 – 5,400m

The candidate site at Ali area



# Future Direction of EAMA and EACOA

## 3: Organization: More important role of EACOA



# Future Direction of EAMA and EACOA

## 4: An Example of EACOA / EAMA meetinbgs

### 1) EACOA Meeting

**Once a year**

- Director's Meeting (Business + Regional Progress Reports)
- Directors + Community Members (several - 10 astronomers)

### 2) EACOA Meeting + EAMA

**Once a 2 years**

- Director's Meeting (Mainly Business)
- EAMA Symposium

Regional Progress Report (Directors)

Large Scale Cooperation (with Directors + Community M.)

Future Direction of EA Cooperation (Discussion)

Cooperation in Various Scales or in Particular Areas  
(optional)

# Future Direction of EAMA and EACOA

## 5: Evolution of EA Cooperation

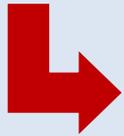
### A Consideration on EAMA/EACOA: Toward new Stage of EA Cooperation

- Now we need more robust and stable structure of cooperation.
- The role of EACOA should be expanded and strengthened.
- We need “Astronomers level” activities also.
- EACOR should involve more community power (universities etc).
- EACOA should establish wider and robust network.
- EAMA symposium can be merged with EACOA meeting.  
(but only once a two years or so)
- Supporting structure (and Funding ?) of EACOA should be strengthened.

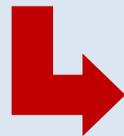
# Future Direction of EAMA and EACOA

## 5: Evolution of EA Cooperation (cont'd)

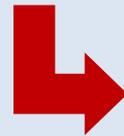
**EAMA  
+  
EACOA**



**Strengthened EACOA  
+ EAMA  
&  
Community (Universities)**



**(Intermediate Structure)  
United Observatories  
Funding Agencies**



**(Future Target)  
East Asian Observatory**

Thank you