

How to proceed next ? towards successful planning of HSC surveys

Japan-Princeton-Taiwan HSC workshop, January 17-20, 2009
@ National Astronomical Observatory of Japan



Yasushi Suto *Department of Physics, The University of Tokyo*

All started from an informal correspondence between Ed and me

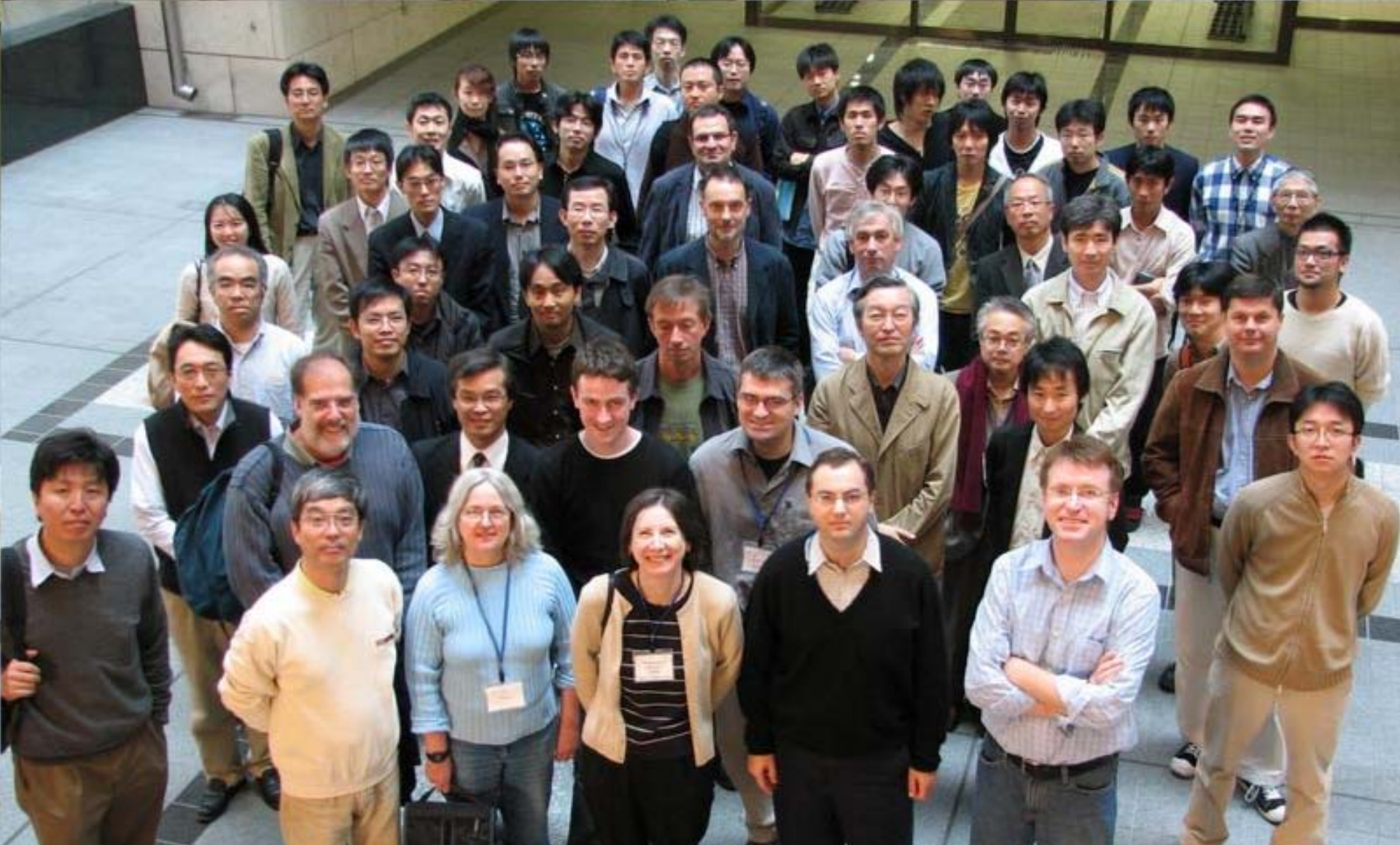
- Fri, 28 Jul 2006 23:07:03 -0400 (EDT)
- Ed Turner wrote “ Dear Yasushi,
- It is of much more direct interest to me than it was when we talked in June. The reason is that in Princeton we have recently had some discussions about the possibility of approaching you (Subaru) re the possibility of some type of collaboration or joint project or perhaps a pair of projects.
- I should emphasize that at this point the whole situation is very uncertain, and this idea is a rather vague one, but it seems to David Spergel (copied on this message) and me that it might be a good time to see if it is totally unrealistic or if it seems to you worth looking into the possibility a bit more. What do you think?

My reply to Ed Turner

- Mon, 31 Jul 2006 07:43:52 +0900 (JST)
- I wrote “ Hi Ed (and David),
- **First of all, I am not a sort of *Subaru persons* by any means, and my opinion does not represent anything official.** Nevertheless I believe that a possible joint project between Subaru and Princeton is definitely welcome by the Subaru community.
- In case you are interested in proceeding a bit further, I am happy to approach several people very informally at this point to see their personal feeling.
- **I understand that the possibility would involve many uncertainties in both sides and thus be fairly unpredictable,** but I believe it is really worthwhile to explore more.

Previous HSC-related workshops/conferences

- **Mar. 2006:** 超広視野撮像・分光器で目指す観測的宇宙論 @ 国立天文台
- **Dec. 2006:** Cosmology with wide-field photometric and spectroscopic galaxy surveys @Univ. of Tokyo
- **Jun. 2007:** Cosmology with wide-field surveys of galaxies @Univ. of Tokyo
- **Mar. 2007:** HSCをめぐるサイエンス検討会@作並温泉
- **Oct. 2007:** Decrypting the Universe: Large Surveys for Cosmology @Royal Observatory Edinburgh
- **Mar. 2008:** 第2回 HSC 研究会 @アクアビィラ伊勢志摩
- **May 2008** Cosmology Near and Far: Science with WFMOS @Waikoloa Beach Marriott, Hawaii
- **Jan. 2009:** Japan-Princeton-Taiwan HSC workshop @NAOJ



Cosmology with wide-field photometric and spectroscopic galaxy surveys
November 9-10, 2006 @ University of Tokyo



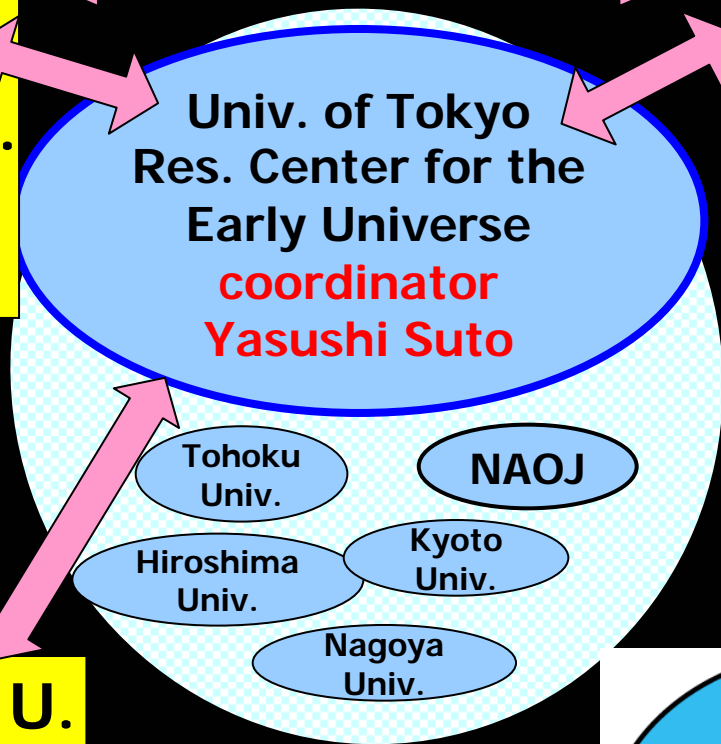
**Discussion on NAOJ-Princeton
collaboration over *Shabu-shabu*
December 19, 2006@Kisoji**

International Research Network for Dark Energy (JSPS, core-to-core program 2007-2012)

DENET

Princeton U.
Dept. of
Astrophys. Sci.
coordinator
Edwin Turner

**Institut
d'Astrophysique
de Paris**
coordinator
Jerome Martin

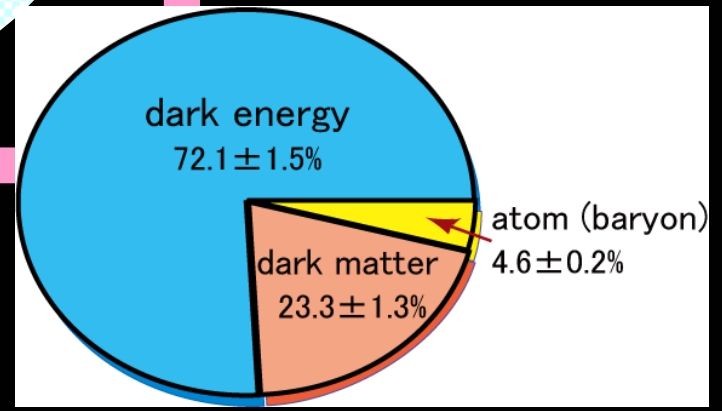


CMB
Gravitational lens
Baryon oscillation

Modified gravity
Extra-dimension
backreaction

Edingburgh U.
Royal Obs.
coordinator
John Peacock

Theoretical model
Baryon oscillation
Weak lens mapping





$$\frac{k^2}{\sqrt{k^2 + m_\nu^2(\bar{z})}} \left(\frac{1}{2} + n_k \right) dk$$

$$\ddot{\phi} + 3H\dot{\phi} + V'(\phi) = 0$$

$$= 8\pi G T_w$$

$$\left(\frac{T_c}{10^{14} \text{ TeV}} \right)^2 \left(\frac{m_\nu}{10^{10} \text{ GeV}} \right)$$

$$\frac{\delta I(\theta, \phi)}{T_0} = \sum_{l, m} a_{lm} Y_{lm}(\theta, \phi)$$

東京大学 大学院
理学系研究科・理学部
SCHOOL OF SCIENCE, THE UNIVERSITY OF TOKYO

JSPS 日本学術振興会
Core-to-Core Program
DENET
International Research
Network for Dark Energy

JSPS core-to-core program workshop

Cosmology with wide-field imaging surveys of galaxies

June 7 - 8, 2007, Koshiba Hall

Invited Speakers

The University of Tokyo



Decrypting the Universe

Large Surveys for Cosmology

Invited Speakers

D. Spergel
S. Cole
E. Copeland
M. Doi
A. Helmi
O. Lahav
R. Maartens
Y. Mellier
S. Miyazaki
A. Murphy
M. Takada
T. Yamada

24th-26th October 2007
Edinburgh, Scotland

Joint Royal Observatory Edinburgh / JSPS
Core-to-Core Program Workshop

www.roe.ac.uk/roe/workshop/2007

Local Organising Committee

A. Heavens
R. Ivison
A. Nicol
P. Norberg (Chair)
P. Simon
F. Simpson
A. Taylor





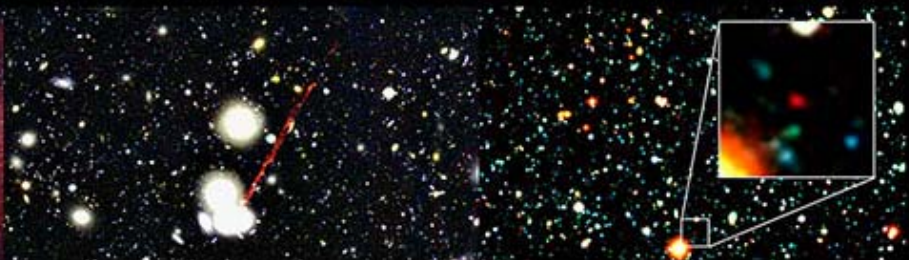
COSMOLOGY NEAR & FAR: SCIENCE WITH WFMOS



Astronomy
Australia
Ltd.



Science & Technology
Facilities Council



Astronomers from Princeton and Japan unite to explore the universe, near and far

- Scientists from Princeton University and the National Astronomical Observatory of Japan (NAOJ) have agreed to collaborate over the next 10 years, using new instrumentation on the Hawaii-based Subaru Telescope to peer into hidden corners of the nearby universe and ferret out secrets from its distant past.
- The partnership, called the **NAOJ-Princeton Astrophysics Collaboration** or **N-PAC**, will provide for the exchange of scientific resources and support a variety of long-term research projects in which **the scientists from both Princeton and the Japanese astronomical community will participate on an equal basis**. The collaboration, announced today (Jan. 15) by both parties in Mitaka, Japan, builds on a decades-long tradition of scientific collaboration between Japanese and Princeton astronomers in a wide range of astronomical fields.

<http://www.princeton.edu/main/news/archive/S23/18/84046/>

HSC timeline

- Mar. 2009: HSC design review
 - 2011: commissioning
 - 2012-2016: Subaru strategic program: HSC survey (300 nights/5 yrs)
- cf: 2010-?? FMOS and then 2016-?? WFMOS???
- **Aug. 2010 ? : deadline of the Subaru strategic program proposal**
 - SEEDS: 24 night/yr x 5yrs (2008-2012?)
 - Deadline: July 31, 2007
 - 1st stage selection: Sep. 28, 2007
 - Interview: Nov. 14, 2007
 - TAC recommendation: Jan.29, 2008
 - SAC decision: Mar. 18, 2008

How to proceed next ?

- **Aug. 2010:** deadline of the Subaru strategic program proposal
- **Jun. 2010:** HSC proposal 1st draft completed and circulated among collaborators
- **Mar. 2010:** Japan-Princeton-Taiwan HSC workshop @ Japan ?
- **Dec. 2009:** draft of HSC survey circulated among collaborators
- **Nov. 2009:** HSC workshop @ Princeton ?
- **Mar. 2009:** 3rd HSC workshop (in Japanese) @ NAOJ or Univ. of Tokyo

A possible organization towards HSC survey design (1)

- Japan is not a country of contract nor lawsuit, but of mutual implicit understanding
- The organization needs not be strict, but fairly flexible/adaptive, e.g.

N-PAC council

PI

HSC Survey Design Committee

Advisers

Working group 1

Working group 2

Working group 3

.....

Working group N

HSC collaborators

The most important idea behind the HSC survey design

- “We are not asking that the Japanese ‘give’ us a fixed number of nights, but rather to work with us on major surveys of mutual interest,” astrophysics professor **Michael Strauss** wrote in an e-mail from Tokyo. “***We will work together to develop these surveys, and reap the benefits jointly.***”

<http://www.dailyprincetonian.com/2009/01/16/22547/>

- “If we design these surveys well, it should allow ***scientific discoveries that we haven't anticipated,***” Strauss said.

<http://www.princeton.edu/main/news/archive/S23/18/84046/>

A possible organization towards HSC survey design (2)

N-PAC council

PI

H.Karoji
S.Miyazaki

HSC Survey Design Committee

Advisers

M.Takada: weak lens
K.Shimasaku: high-z objects
M.Chiba: Galactic archeology
J.Gunn: galaxy evolution
M.Strauss: everything

scientific
D.Spergel, T.Yamada,
N.Yasuda, ...
non-scientific
E.Turner, Y.Suto, ...

**Working
group 1**

**Working
group 2**

**Working
group 3**

.....

**Working
group N**

HSC collaborators