

# DENET : International Research Network for Dark Energy

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DENET (International Research Network for Dark Energy) is a Core-to-Core Program funded by JSPS (Japan Society of Promotion of Science) along with French, British and US institutions for 2007-2012. I am the PI of the program, and three co-PI's include Edwin Turner at Princeton University, Jerome Martin at Institut d'Astrophysique de Paris, and John Peacock at the University of Edinburgh (see Fig.1). The participating institutions of the program include the University of Tokyo, the National Astronomical Observatory of Japan (NAOJ), Tohoku University, Nagoya University, Kyoto University, Hiroshima University, Princeton University, the California Institute for Technology, the Lawrence Berkeley Laboratory at the University of California at Berkeley,



the Massachusetts Institute of Technology, the University of Chicago, the University of Edinburgh, the Institute of Cosmology and Gravitation at the University of Portsmouth, University College London, Oxford University, Institut d'Astrophysique de Paris, and Universite de Lyon, among others.

The main purpose of DENET is to promote international collaboration on dark energy in the universe, with particular emphasis on the exchange of young researchers among the participating institutions. Its annual budget, a bit more than 20 million Japanese yen, is earmarked for the purpose of supporting Japanese researchers as they visit and work with collaborators at the participating institutions, and for holding international conferences in and outside of Japan each year. The budget, however, cannot be used for any expenses for non-Japanese participating members, as their expenses should be covered by the matching funds provided from the other participating institutions.

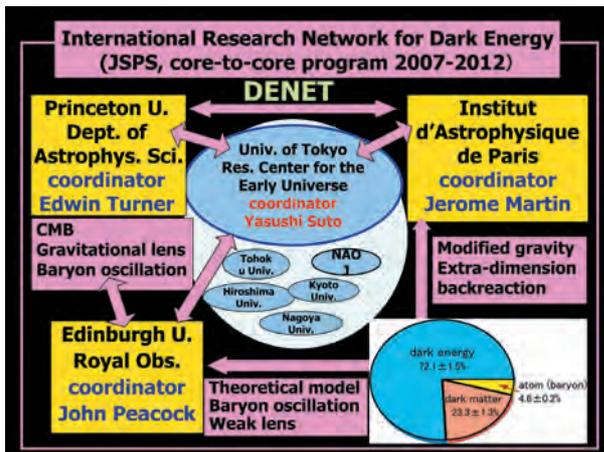


Fig. 1

Yasushi Suto is a professor in Department of Physics and RESCEU (Research Center for the Early Universe), The University of Tokyo. He has been appointed as a Global Scholar in Department of Astrophysical Sciences, Princeton University for 2009 - 2012. He is working on observational cosmology and extrasolar planets.

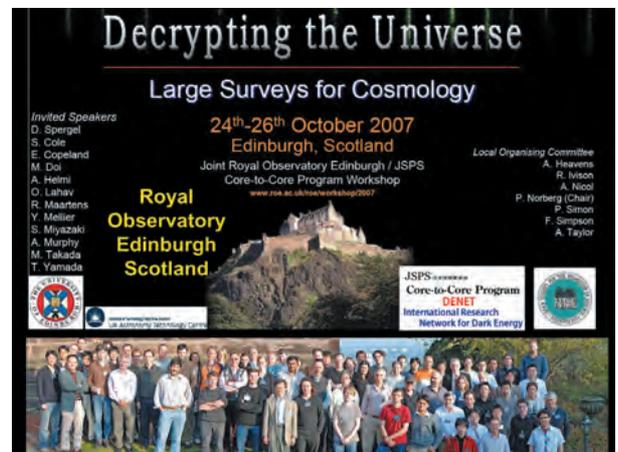


Fig. 2



Fig. 3

For the last five years, DENET has organized five international conferences concerning dark energy in the universe. The first of the series, entitled “Decrypting the Universe – Large Surveys for Cosmology,” was jointly organized with the Royal Observatory, Edinburgh and held from October 24 to 26, 2007 (Fig.2). The second conference, “Cosmology Near and Far; Science with WFMOS,” was held at Kona Marriot Hotel, Hawaii from May 19 to 21, 2008 (Fig.3) as was the first Subaru-Gemini Joint Science conference. The third conference, “Science Opportunities with Wide-Field Imaging and Spectroscopy of the Distant Universe,” was jointly organized with Department of Astrophysical Sciences, Princeton University, and was held from November 9 to 11, 2009 (Fig.4). The fourth conference, entitled, “The Observational Pursuit of Dark Energy after Astro2010,” was held at the Cahill Center for Astronomy and Astrophysics, Caltech from October 7 to 9, 2010. I would like to mention here that a member of DENET and one of the panel discussion speakers at this conference, Saul Perlmutter (see Fig.5), received the 2011 Nobel Prize in Physics on October 4, 2011.

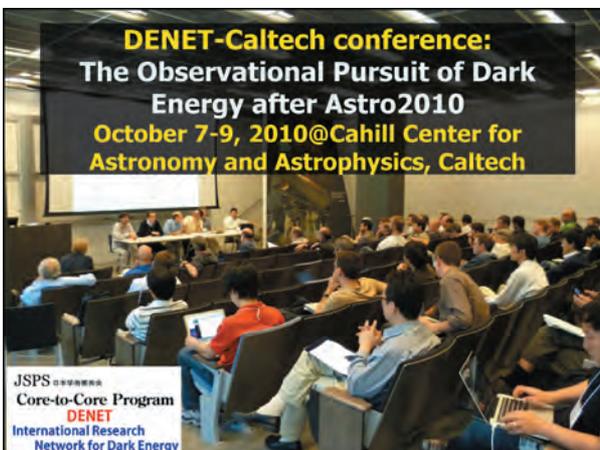


Fig. 5

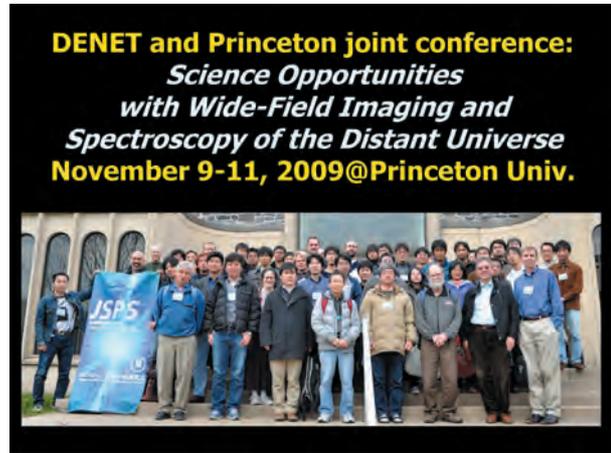


Fig. 4

The last conference of this series “The Accelerating Universe,” which was particularly timely after the 2011 Nobel Prize in Physics, was held at Institut d’Astrophysique de Paris from October 24 to 26, 2011.

Incidentally, the conference in 2011 entitled “The Accelerating Universe,” was part of the Todai Forum, which is held approximately biennially to promote academic and student exchange and to introduce the latest research activities at The University of Tokyo with close partnership with globally renowned academic institutions around the world. In 2011, the partner institutions are Collège de France, CNRS, Université de Lyon and other institutions (including IAP) which have sustained close academic relationships with the University of Tokyo over the years (Fig.6).

In addition to those international conferences, DENET organized a summer school each year in which three lecturers were invited and gave a series of introductory talks on dark energy mainly for graduate students in Japan. In order to promote discussions in an



Fig. 6



Fig. 7



Fig. 8

informal and relaxing atmosphere, we intentionally held the school at several resort places in Japan, often with wonderful hot springs (Fig.7). The invited lectures and the locations of the last five summer schools are as follows; Nemanja Kaloper, David Parkinson, and Mamoru Doi (at Hakone, Kanagawa prefecture from September 1 to 4, 2007); Alan Heavens, Andrei Frolov, and Kazuya Koyama (at Asamushi, Aomori prefecture from August 31 to September 2, 2008); Alexei Starobinsky, Michael Seiffert, and Will Percival (at Ginowan, Okinawa prefecture from August 31 to September 2, 2009); Dragan Huterer, Jerome Martin, Massimo Meneghetti (at Kochi from August 30 to September 1, 2010); and Roy Maartens, Shirley Ho, Toru Yamada, and Alexei Starobinsky (at Aso, Kumamoto prefecture from July 26 to 29, 2011).

The activities of DENET played a significant role in establishing the next generation wide-field imaging camera, Hyper-Suprime Cam (HSC), on the Subaru telescope with researchers from Japan, Princeton, and Academia Sinica Institute of Astronomy and Astrophysics (ASIAA) at Taiwan. Now, wider international collaboration among researchers in Japan, the US, France, Taiwan, and Brazil in order to conduct a spectroscopic galaxy survey with the Subaru telescope

is underway. The collaboration is called SuMIRe (Subaru Measurement of Images and Redshifts in the universe), and is being led by the PI of the project, Hitoshi Murayama, director of IPMU (Institute of Physics and Mathematics of the Universe), the University of Tokyo.

While DENET does not have a formal partner institute in Asia, it has a close scientific relations with ASIAA through SuMIRe. Indeed, DENET organized a joint HSC collaboration meeting at ASIAA on March 7 and 8, 2011 with wonderful support by numerous collaborators there (Fig.8).

The funding for DENET will finish at the end of March, 2012. However, I believe that it was such a successful program that DENET will effectively continue; I believe we will continue to see as a variety of future activities by young researchers who have enjoyed the truly international collaboration opportunities which were made available for the last five years via DENET. Finally, on behalf of all the members of DENET, I would like to thank JSPS for the generous support of our five-year activities on dark energy research.