

## SATU Joint Research Scheme

### Call for Proposals

**Application Deadline: April 15, 2012**

#### OVERVIEW

In order to provide the interchange platform to integrate resources and facilitate mutual research cooperation among SATU member universities, SATU International Secretariat launches the SATU Joint Research Scheme.

The SATU Joint Research Scheme initiates the engagement and mutual cooperation of researchers within the SATU member universities through integration of academic resources and linkage of research interests among researchers of the region. The aim of the Scheme is to increase the quality, quantity and profile of SATU research cooperation.

The SATU Joint Research Scheme serves as a platform to connect scholars who share similar research interests and integrate resources to support the academic research exchanges within SATU member universities.

Activities such as seminars and workshops will be incorporated with the 2012 Presidents' Forum to present the work of the joint research teams under the Scheme, and to promote the awareness of and involvement in collaborative opportunities in the region.

#### CURRENT CALL FOR PROPOSALS

##### A.

<b>Project Title</b>	Microalgae-based biofuels and biorefinery
<b>Research Topics</b>	<ul style="list-style-type: none"> <li>• Isolation of high-potential microalgae species</li> <li>• Mass production and high cell density cultivation for microalgae</li> <li>• Microalgae oil/lipid production</li> <li>• Microalgae-based carbohydrate production</li> <li>• Microalgae-based biofuels conversion technology</li> <li>• Bio-based chemicals production from microalgae</li> <li>• Microalgae harvesting and downstream processing</li> </ul>
<b>Project Description</b>	Microalgae are considered the third generation feedstock for biofuels. In addition, the future resources for food and chemicals will

	<p>potentially come from ocean with microalgae as one of the major marine resources. Microalgae have the ability to fix carbon dioxide at a much faster rate than that of terrestrial plants. The fixed carbon dioxide is converted to microalgal biomass, which has potential applications in producing biofuels, animal feed, health food, pharmaceuticals, and other high-value products. Therefore, using microalgae to mitigate CO<sub>2</sub> emissions is a promising strategy for CO<sub>2</sub> storage and utilization.</p> <p>Since South Asia is the geographical area that contains the most abundant bioresources on earth. In particular, this area is also one of the best locations in the world for microalgae cultivation in terms of light supply, climate, and algae species diversity. Therefore, developing microalgae industry in this area is very suitable and has a high potential. To make the concept of microalgae industry a reality, many new technologies and engineering approaches should be developed (e.g., large-scale cultivation, biomass harvesting, product conversion technology, etc.). This project is aimed to develop key technologies required for realizing commercialization of biofuels and bio-based chemicals production using microalgae as the feedstock.</p>
<p><b>NCKU Project Hosting Center</b></p>	<p>Research Center for Energy Technology and Strategy</p>
<p><b>NCKU PI / Co-PI</b></p>	<p><b>PI:</b> Prof. Jo-Shu Chang, Department of Chemical Engineering, NCKU</p> <p><b>Co-PI:</b></p> <ul style="list-style-type: none"> <li>• Prof. Wen-Tung Wu, Research Center for Energy Technology and Strategy, NCKU</li> <li>• Dr. Chun-Yen Chen, Center for Bioscience and Biotechnology, NCKU</li> </ul>

## B.

<p><b>Project Title</b></p>	<p>Dissecting the Role of Viral Population Diversity in Pathogenesis of Enterovirus 71</p>
<p><b>Project Description</b></p>	<p>Human enterovirus 71 is a common causative agent of hand, foot and mouth disease (HFMD). In the recent years, EV-71 has emerged as a more neurovirulent virus killing many young children in many parts</p>

	<p>of Asia especially Taiwan and Malaysia (Huang <i>et al.</i>, 2011, Chan <i>et al.</i>, 2011). EV-71 outbreak occurs in a cyclical pattern of every two-three years. Continuous surveillance of EV-71 in different parts of Asia especially Taiwan, Malaysia and Thailand will enable a better control of future outbreaks. In the first part of our study, we propose to initiate EV-71 surveillance in Taiwan, Malaysia and Thailand. The surveillance data will be updated weekly or monthly and the three countries will be alerted if there's any increase in EV-71 cases.</p> <p>The second part of the study will include the understanding of the mechanism of EV-71 virus neurovirulence. In this study, we hypothesize that virus population diversity influence pathogenesis. EV-71 is RNA virus, and has genome that is error-prone due to low fidelity of their RNA polymerases. This thus creates a population of viruses with related sequences termed as quasispecies. The high mutation rate of RNA viral replication is beneficial at the population level because it increases the probability of virus adaptation to a new environment during infection (Lauring and Andino, 2010). In poliovirus, increasing the fidelity of viral RNA polymerase reduces the viral diversity and leads to loss of neurovirulence in mice (Vignuzzi <i>et al.</i>, 2006). It is postulated that the neurotropic EV-71 is highly quasispecies in nature and that contributes to higher virulence in human. Different EV-71 virus strains from Taiwan, Malaysia and Thailand will be pyrosequenced using next-generation DNA sequencer to determine the quasispecies characteristics. The viral population diversity of these strains isolated from fatal and mild cases will be compared. The understanding of viral quasispecies will reveal the actual antigenic changes in the virus. The study will help us to understand how the viral populations can adapt and evolve in human, and has great implication in the design of vaccine and antiviral drug.</p>
<p><b>NCKU Project Hosting Center</b></p>	<p>Infectious Diseases and Signaling Research Center</p>
<p><b>NCKU PI / Co-PI</b></p>	<p><b>PI:</b> Prof. Jen-Ren Wang, Medical Laboratory Science and Biotechnology, NCKU <b>Co-PI:</b></p> <ul style="list-style-type: none"> <li>• Pro. Ching-Chuan Liu, Pediatrics, NCKU</li> </ul>

	<ul style="list-style-type: none"> <li>• Pro. Yee-Shin Lin, Microbiology and Immunology, NCKU</li> </ul>
--	--

## C.

<b>Project Title</b>	Medical Device Innovation
<b>Research Topics</b>	<ul style="list-style-type: none"> <li>• Advanced Neuromusculoskeletal Researches</li> <li>• Market-Oriented Medical Device Development</li> <li>• Educational promotion</li> </ul>
<b>NCKU Project Hosting Center</b>	Medical Device Innovation Center
<b>NCKU PI / Co-PI</b>	<b>PI:</b> Prof. Fong-Chin Su, Medical Device Innovation Center, NCKU

## D.

<b>Project Title</b>	Photovoltaic Power System
<b>Research Topics</b>	Design and Implementation of Photovoltaic Power System
<b>Project Description</b>	<p>With the environment issues and the resource exhaustion problems start to gaining worldwide attention, the acceleration of progress in the development of the sustainable energy is urgently needed. The solar energy is a clean and limitless resource. In addition, the electricity generated by the photovoltaic is an excellent solution to increasing the reserve margin of utility power system. Thus, many countries have proposed the solar energy installation programs to aggressively encourage people to set up the photovoltaic power system.</p> <p>Generally, the photovoltaic system can be divided into three categories: Si-based, thin film, and multi-junctions. The type of the photovoltaic system is determined by the environment, terrain, climate, and site. This research focuses on the design and the implementation of the photovoltaic power generation system. In addition, the shading effects due to dust, bird-dropping, and the shadow of the building are analyzed, hoping to increase the electrical power generation in the long run.</p>
<b>NCKU Project Hosting Center</b>	Advanced Optoelectronic Technology Center
<b>NCKU PI / Co-PI</b>	<b>PI:</b> Prof. Tsorng-Juu Liang, Dept. of Electrical Engineering, NCKU

# SATU Presidents' Forum

of Southeast and South Asia and Taiwan Universities  
台灣與東南亞暨南亞大學校長論壇

☎ : National Cheng Kung University  
No. 1, University Road,  
701 Tainan City, Taiwan  
☎ : +886-6-2099250  
☎ : +886-6-2085608  
@ : satu@conf.ncku.edu.tw  
🌐 : <http://conf.ncku.edu.tw/satu>

## AWARDS

To implement the Scheme, SATU International Secretariat offers research grants which are applied to all SATU member universities. Each project consists of a team of researchers while NCKU faculty acts as the principal investigator to the project and scholars of SATU member universities act as co-principal investigators. SATU International Secretariat funds project co-principal investigators whose institutions are outside of Taiwan the accommodation and economy-class roundtrip airfare for a project presentation visit to National Cheng Kung University before October 2012. Approximately three Co-PIs under each project will receive the grants in 2012.

## ELIGIBILITY

Applicants must be working at SATU member universities and have received the doctoral degree.

## APPLICATION REQUIREMENTS

Three Co-PI positions are available for application for each four projects. To apply for project Co-PIs, please select one of the four projects and complete the Application Form as attached below. All applications must be recommended and submitted by SATU member universities to [satu@conf.ncku.edu.tw](mailto:satu@conf.ncku.edu.tw). Applications sent by individuals will not be accepted.

Attachment: [SATU Joint Research Scheme Application Form](#)

## APPLICATION DEADLINES

Proposals will be reviewed by individual project hosting centers at NCKU with selection decisions made within two weeks of the application deadline. Deadlines for proposals are:

**April 15, 2012**

## CONTACT

SATU Presidents' Forum International Secretariat

National Cheng Kung University

E-mail: [satu@conf.ncku.edu.tw](mailto:satu@conf.ncku.edu.tw)

Tel: +886-6-2757575 ext. 50956

Fax: +886-6-2373551