

# PRAGMA31 Workshop

7th - 10th September, 2016      Bangkok, Thailand

## Updates Since PRAGMA 30

2016 September 8

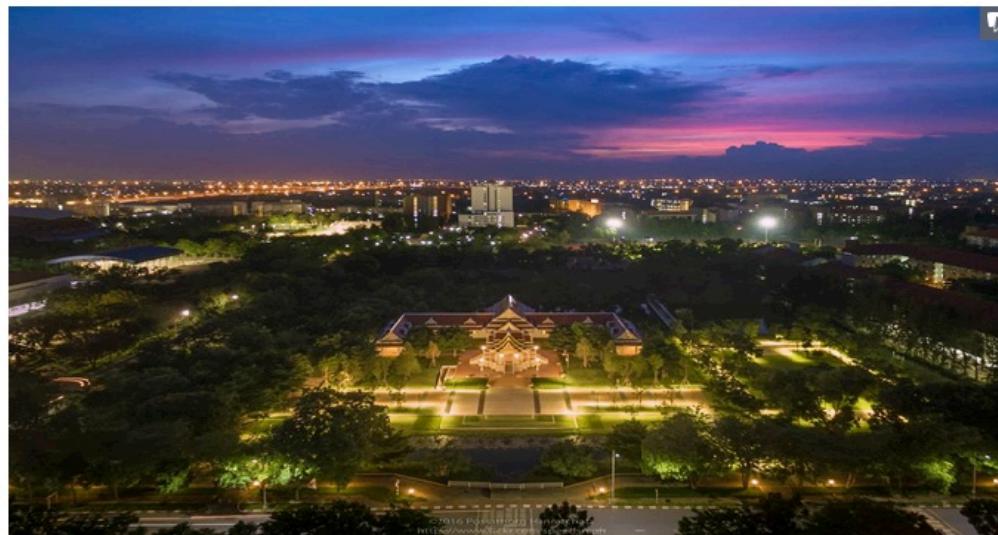


Photo: Possathorn Hanratchata

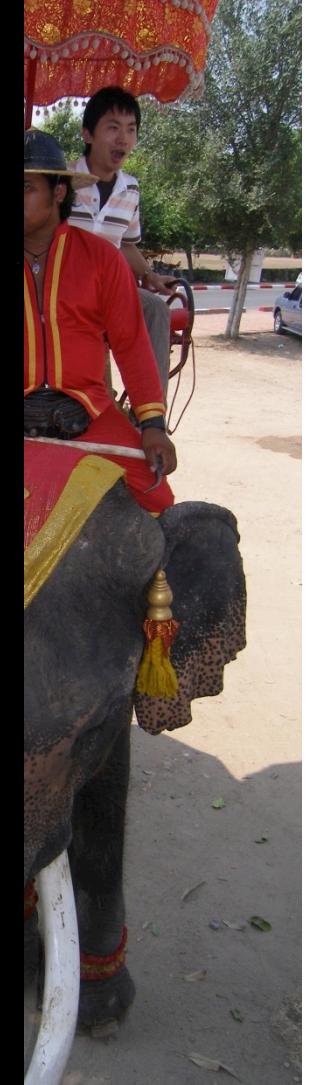
Thithi Satsada Monastic Residence , Thammasat Rangsit Campus.

# PRAGMA 12

## 2007 March 20 - 22



## And There is the Culture and Transportation





# New Members at PRAGMA 24

## Welcome!

- Thammasat University
- U Florida
- Indiana University
- U Wisconsin



DATA TO INSIGHT CENTER

INDIANA UNIVERSITY  
Pervasive Technology Institute



We look forward to your active engagement!



# Celebrations





2016.01.29

# Cultural Exploration of Manila



# An Incredibly Full Week @ PRAGMA 31

Day	Events
Monday	Student Hackathon ASEAN IVO (International Virtual Organization) Meeting
Tuesday	Student Hackathon ASEAN IVO Meeting Baseline Environmental Data Capture Project in the Lower Mekong Basin Meeting
Wednesday	<b><u>Asia-Pacific Open Data Summit (APODS) 2016</u></b> CS@TU Undergraduate and Graduate Symposium PRAGMA Students
Thursday	PRAGMA 31 Banquet Dinner
Friday	PRAGMA 31
Saturday	Wrap up/Cross-working group discussions Cultural learning and excursion

# Student Hackathon

*Students Learn, PRAGMA's Tools and Users Benefit*

- Goals
  - Merge together tools developed by PRAGMA members (pragma-boot, pragma-ENT, cloud scheduler)
  - Verify proof of concept: how good is documentation to get resources on PRAGMA ENT
  - Visualize PRAGMA resources: sites registered with cloud schedule to be seen on geographic map, and make updates dynamic
- We will hear about this on Friday!
  - Nadya William, Aimee Stewart, Shava Smallen

# Software Defined System on Disaster Mitigation and Smart Cities

ASEAN IVO  
2016

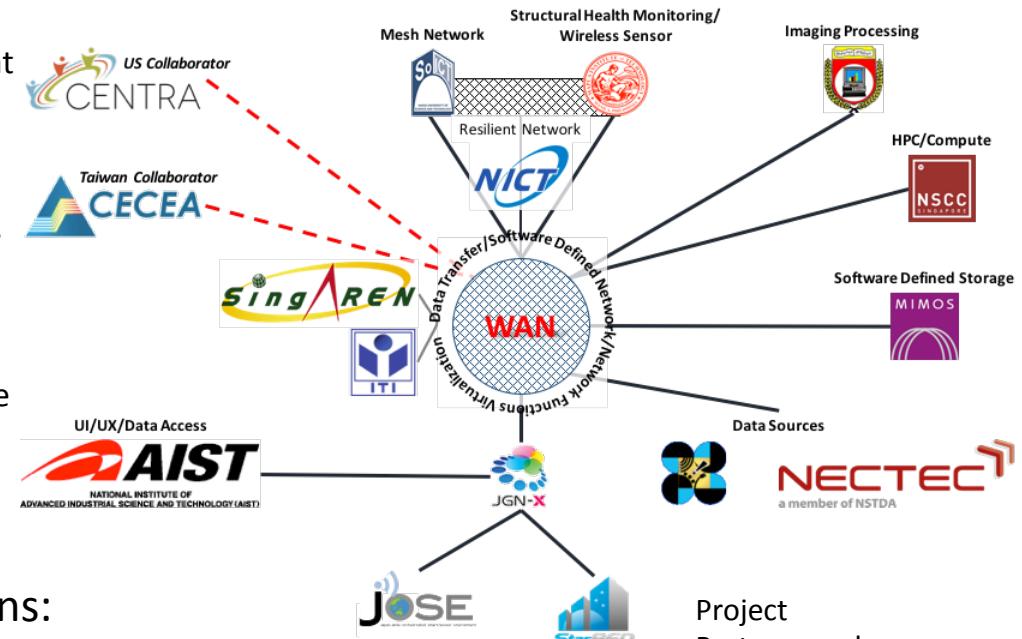
**Goals:** This project addresses the impact of climate change on cities and urbanization, with particular relevance to the priority area of improving environmental resilience and more specifically in disaster mitigation.

## Members:

Member	Affiliate Institution	Country
1 Jason HAGA	AIST	Japan
2 Eiji Kawai	NICT	Japan
3 Hiroshi Kumagai	NICT	Japan
4 Hong H. ONG	MIMOS	Malaysia*
5 Jing Yuan LUKE	MIMOS	Malaysia
6 Myint Myint SEIN	University of Computer Studies, Yangon	Myanmar
7 Alejandro H. Ballado Jr.	Mapua Institute of Technology	Philippines
8 Jelina Tanya H. Tetangco	ASTI	Philippines
9 Bu Sung LEE	SINGAREN	Singapore
10 Kanokvate Tungpimolrut	NECTEC	Thailand
11 Hong Son NGO	Hanoi University of Science and Technology	Vietnam
12 Van Dzung DINH	Vietnam National University (Hanoi)	Vietnam

## Activities:

- Develop a Software Defined System architecture blueprint for disaster mitigation, crisis communication, and emergency management that can monitor and report disaster events in near-realtime.
- Investigate programmability aspects of IoTs technologies, networking, and edge/cloud computing platforms.
- Conduct field testing of potential use cases using NICT's existing testbeds such as JGN-X, Starbed, and JOSE.
- Organise workshops with ASEAN members to disseminate R&D results.
- Dialogue with PRAGMA (NSF, US), CENTRA (NSF, US), and CECEA (Taiwan) on similar R&D challenges to accelerate project activities.



Questions:  
Hong Hoe ONG

\* Contact: [hh.ong@mimos.my](mailto:hh.ong@mimos.my)

# Establishing a Central Research Database for the Lower Mekong Region: *Opportunity for PRAGMA and CENTRA*

## The need for data sharing

**CENTRA**

- Research increasingly focusing at the ‘nexus’ of domains and systems
- Researchers wants to share data, and ultimately return value to the Mekong
- Lack of awareness & coordination
- Difficulties due to data owners’ lack of control over data



## A capable and accessible database to support data sharing

- Distributed architecture: bring database to data owners
- Workflow: support custom protection control over datasets
- Bottom-up architecture: “crowd-source” data
- Tools: support data curation

**Data:** Hydrology, biodiversity (indicator species),  
land use coverage, and population distribution

See: Tho Nguyen



# Asia Pacific Open Data Summit

## *Increase transparency; foundation for innovative services*

### PRAGMA31 Workshop

5th - 10th September, 2016   Bangkok, Thailand

[Home](#)   [Program](#)   [Invited Speakers](#)   [Organizing Committee](#)   [Venue](#)   [Accommodations](#)   [Contact](#)   [Sign In/Register](#)

Asia Pacific Open Data Summit 2016 Wednesday 7th September 2016 S31 Sukhumvit Hotel, Bangkok, Thailand	
TIME	PROGRAM
08.30 - 09.00 am	Registration
09.00 - 09.10 am	WELCOME SPEECH By: Dr. Sak Segkhoonthod President and CEO of Electronic Government Agency (Public Organization) (EGA)
09.10 - 09.25 am	"OPEN DATA SUMMIT" OPENING SPEECH By: Dr. Uttama Savanayana Minister of Information and Communication Technology
09.25 - 9.35 am	OPENING SPEECH By: Dr. Somkit LertPaithoon Rector, Thammasat University

### Other Components

- Awarding Hackathon Winners
- Keynote: Open Data For a Digital Society
- Panels
  - Open Data & Digital Economy
  - Future of Open Government Partnership in Asia Pacific
  - Agriculture & Climate Change



# ASEAN IVO: Members

- Brunei: University Brunei Darussalam
- Cambodia: National Institute of Posts, Telecommunications and Information and Communications Technology (NIPTICT)
- Indonesia: BPPT (Badan Pengkajian dan Penerapan Teknologi) (Agency For The Assessment And Application Of Technology); Ministry of Communications and Information Technology
- Malaysia: MIMOS Berhad; Universiti Teknologi Malaysia
- Myanmar: University of Computer Studies, Yangon (UCSY)
- Philippines: Mapua Institute of Technology (MIT)
- Singapore: Institute for Infocomm Research (I<sup>2</sup>R); Singapore Advanced Research and Education Network; School of Humanities and Social Sciences, Nanyang Technological University; Faculty of Engineering National University of Singapore
- Thailand: Chulalongkorn University; National Electronics and Computer Technology Center (NECTEC); Chiang Mai University; Office of Information Technology Administration for Education Development, Commission on Higher Education; Thai-Nichi Institute of Technology; National Institute of Metrology; King Mongkut's Institute of Technology Ladkrabang
- Vietnam: Posts and Telecommunications Institute of Technology (PTIT); Vietnam National University International Francophone Institute (VNU IFI); Vietnam National University University of Engineering & Technology (VNU UET); Vietnam National University Information Technology Institute (VNU ITI); Institute of Information Technology Vietnamese Academy of Science and Technology (IOIT); Hanoi University of Science and Technology (HUST)
- Japan: National Institute of Information and Communications Technology (NICT)

# PRAGMA

## *Many descriptors, common goal*

- Community of practice
  - Long tail of science
- Framework for collaboration
  - People drive activities
- Market place of ideas
  - Trusted environment to share
- Nurturing environment
  - Support students and participants to learn and share resources



**Advancing knowledge\* through active, collaborative engagement**

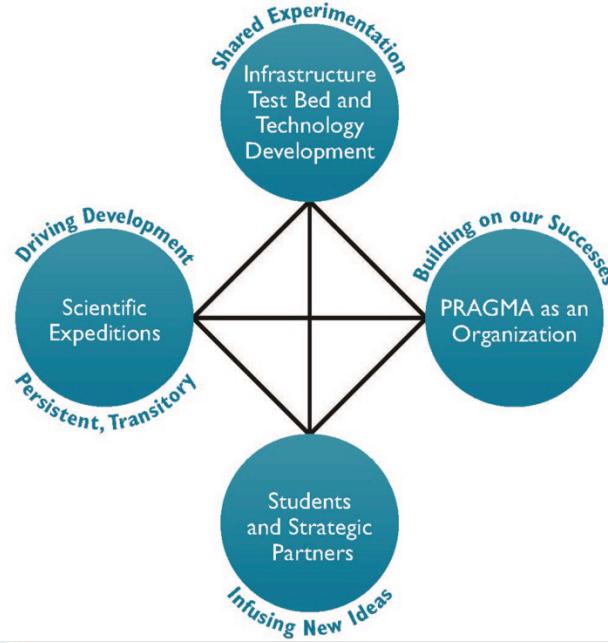
# PRAGMA: A Community of Practice Enabling the Long Tail of Team Science



Virtual Scientific Expeditions



PRAGMA Students



PRAGMA Member Sites



Trust Envelop

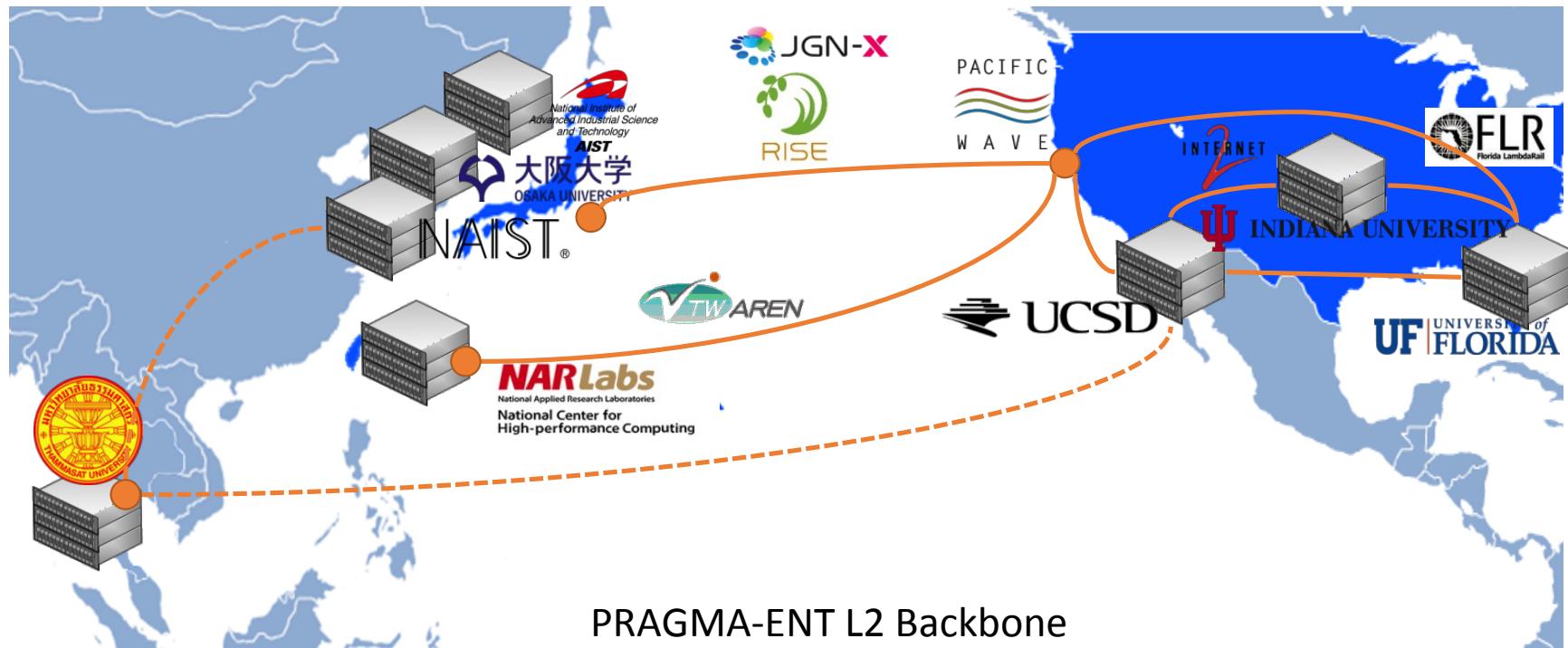


PRAGMA Community

# PRAGMA-ENT

DEMONSTRATIONS

## Software defined experimental network testbed



High-speed research networks (FLR, Internet2, JGN-X, TWAREN, and PacicWave)  
OpenFlow-enabled hardware switches in the USA (U Florida, UC San Diego , Indiana U),  
Japan (Nara-NAIST, Osaka U and AIST), Taiwan (NARL/NCHC) and Thailand (Thammasat U)  
Contacts: Kohei Ichikawa, Matt Collin

Expanded Backbone to Thammasat; Uses IPOP to expand backbone

# Virtual Biodiversity Expedition

## Made Lifemapper Portable – Needed to Address Pinned Data



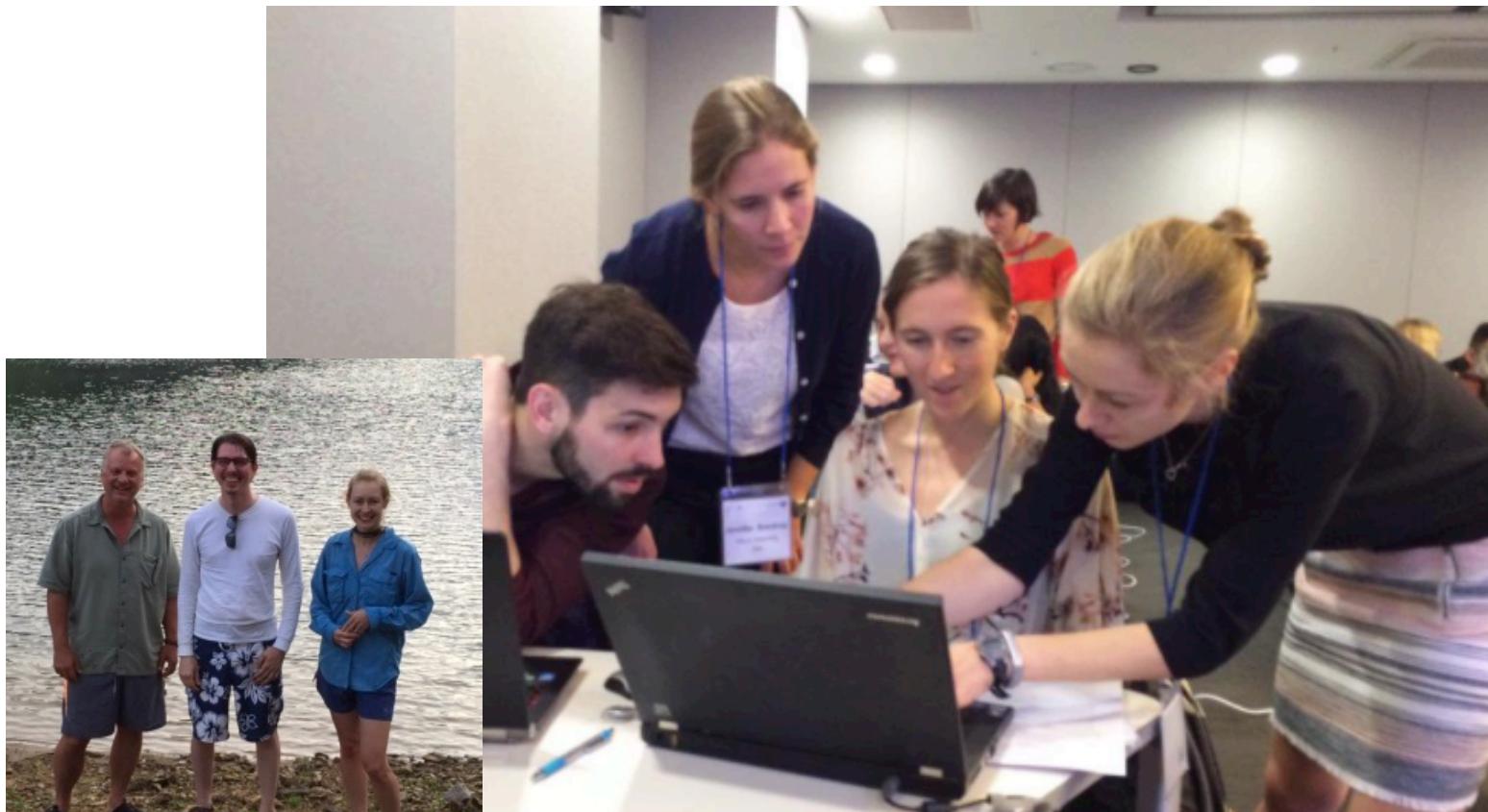
Student  
Hackathon

Virtual Cluster Installation Console  
Contacts: Nadya Williams, Aimee Stewart

Lifemapper runs on Comet at SDSC, being used

# GLEON Research and PRAGMA Lake Expedition

## GRAPLER: Harnessing Computational Resources and High-Frequency Data for Global Lake Ecology Research



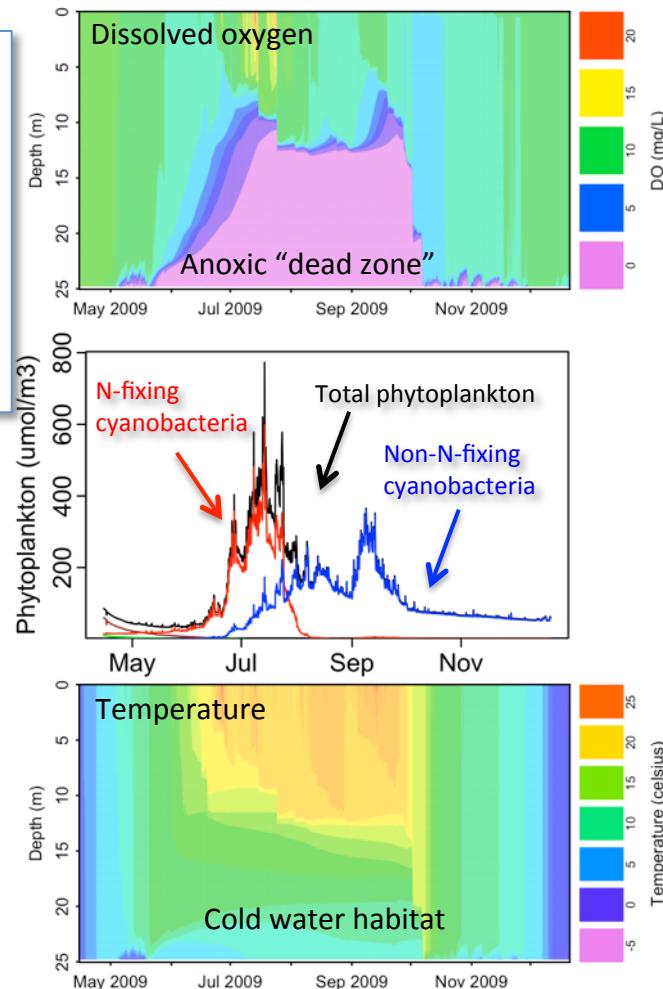
**DEMO**

R-interface front-end to scheduled resources (HTCondor) via overlay networks (IPOP)  
Contact: Paul Hanson\*, Renato Figueiredo, Cayelan Carey

Software Improved; Science Understanding Advanced; Active Training Underway

# The Power and Limit of the Model

Computer simulation of Lake Mendota Wisconsin shows how warm summer temperatures and nutrients allow potentially noxious phytoplankton (cyanobacteria) to dominate. These same conditions lead to an anoxia in deeper cold water, rendering this lake uninhabitable by coldwater fish species.



**The Opportunity: More to do!**  
Does not yet predict the rare events

# Easing Deployment and Use of PRAGMA Cloud Leveraging PRAGMA Boot, Personal Cloud Controller, and PRAGMA-ENT

The screenshot shows the PRAGMA Cloud Scheduler interface. On the left, there's a sidebar with a 'Resource Filter' section containing dropdowns for 'Resource Type' (set to 'All'), 'Deployment type' (set to 'ENT-enabled'), and 'ENT-enabled'. A red box highlights this section with the text 'Filter resources by attributes'. In the center, a yellow box displays a 'Reservation Summary' for a reservation starting on 2015-05-09 at 09:00, listing resources like 'SDSC cloud1' and 'SDSC cloud2'. A red box highlights this area with the text 'View reservation summary by scrolling over reservation (in blue)'. Below this, a timeline grid shows resource availability from 09:00 to 23:00 on May 9th. A red arrow points from the 'View resource details by scrolling over resource name' text to the 'SDSC cloud2' entry in the grid. To the right of the grid, a 'Create a new reservation' dialog box is open, showing fields for 'Start Date' (2015-04-01), 'End Date' (2015-04-01), 'Reservation Length' (1 hour), 'Repeat' (Once Per Day), 'Time of reservation' (PRIMER 20:04:00), and 'Description of reservation'. A red box highlights this dialog with the text 'Make a new reservation by clicking on an available time slot.'.

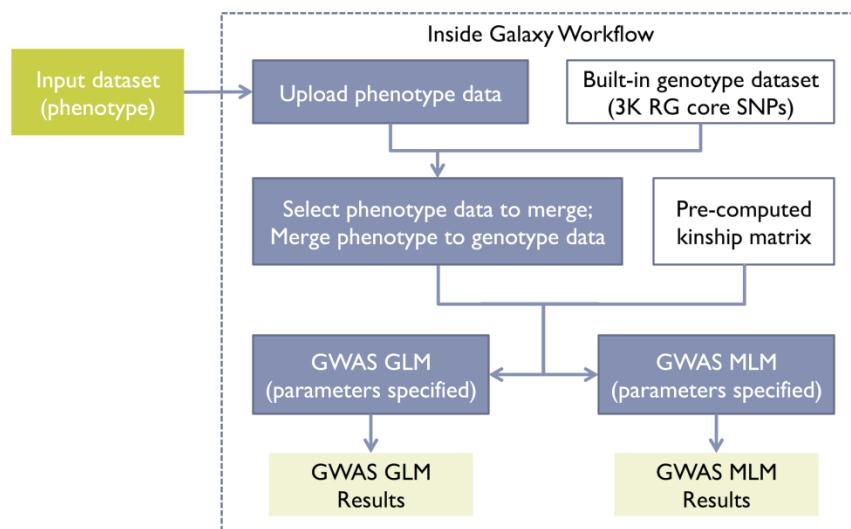
DEMO

Contact: Shava Smallen

Screenshot of PRAGMA Booting Web Interface  
When reservation is activated, scheduler will use PRAGMA boot and PCC to launch virtual cluster, configuring public/private network

# International Rice Resource Institute

## Stimulation from PRAGMA 30 for Biosciences and PRAGMA Data Activities



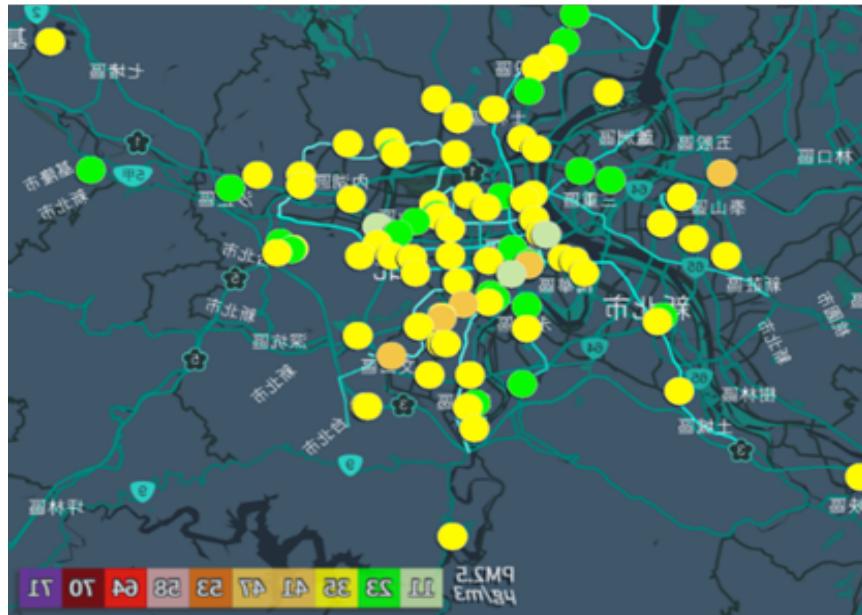
Overview of TASSEL-GBS workflow  
for rice genomics studies  
- GBS: Genome-typing-By-Sequencing

- Motivated at
- Engaged Biosciences, Data Expertise (RDA), and PRAGMA Students
- Products
  - Workflow
  - Captures data provenance within a PRAGMA VM, adds tooling to a VM to extract key data results from the VM
  - New standalone PRAGMA data services to assign Persistent Identifiers to key data results.

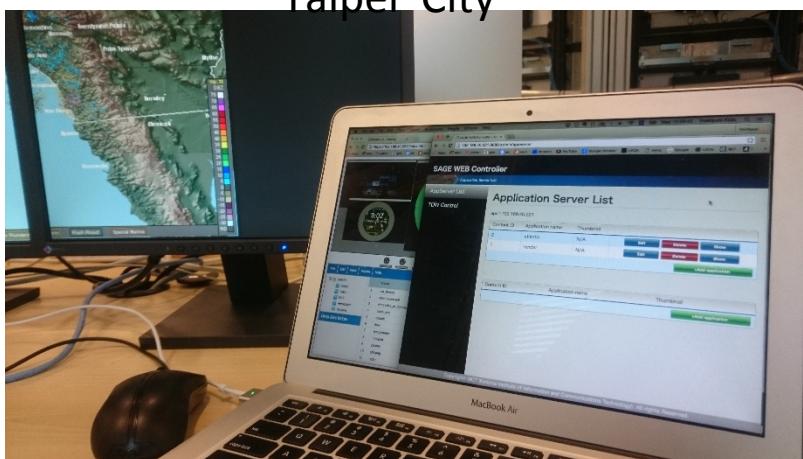
Contacts: Jason Haga, Beth Plale, Quan Zhou

**DEMO**

# Telescience and Cyberlearning



PM2.5 monitoring using Airbox and LASS  
Taipei City



Collaborative Visualization Web-based  
Environment based on SAGE-2

A screenshot of the EDISON portal website. The header reads "EDISON\_CFD" and "EDISON\_CFD". The main menu includes "SCIENCE APPS", "SIMULATION", "VIRTUAL LAB", "CONTENT", "NEWS", "STATISTICS", and "My EDISON". Below the menu, there are two circular icons: one for "Simulation" with a "GO" button and another for "ScienceApp" with a bridge icon. A banner at the bottom states "CFD :: Bridge to Computational Science for Higher Education and Advanced Research". The right side of the page shows "System Resource Statistics" with a table for Site, Cluster, Total, Used, and Avail, all showing "No Data".

EDISON portal site deployed at NCHC



iEco Award Korea

**DEMO**

# PRAGMA Students

## *Developing Future Scientists, Researchers and Citizens*

- **Aspirational Goal**
  - Develop technically knowledgeable, culturally inclusive, and interdisciplinary scientists capable of leading global research.
- **Opportunities**
  - Provide **education** and **mentoring**
  - Generate professional **network** and train **leadership**
  - Infuse **new ideas** to PRAGMA community
  - **Internship** and **exchange program** with PRAGMA member institutions



# Student Activity Overview @ PRAGMA31

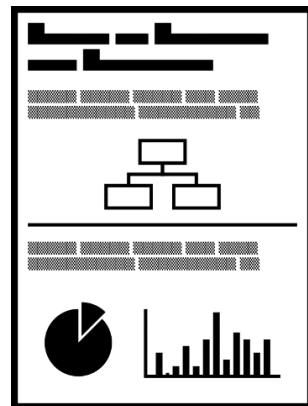


Hackathon (4)

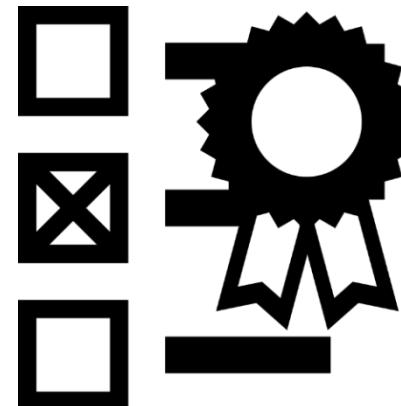
Friday  
Morning



Lightning Talks (10)



Poster Presentation (18)



Poster Voting (3)

Source: Gabriel Zhou, Pongsakorn U-chupala

# Exchange Program

## *Experiential Learning*

Page    Messages    Notifications 1    Insights    Publishing Tools    Settings    Help ▾

Add a Picture

AIST Interns  
2016  
@aist2016

Home

About

Photos

Likes

Videos

Posts

Manage Tabs

+ Add Shop Section

Like    Message    More

+ Add a Button

Status    Photo / Video    Offer, Event +

Write something...

This Week

See All

Computers/Technology

Search for posts on this Page

4 likes 0 this week  
Pup Dush and 2 other friends

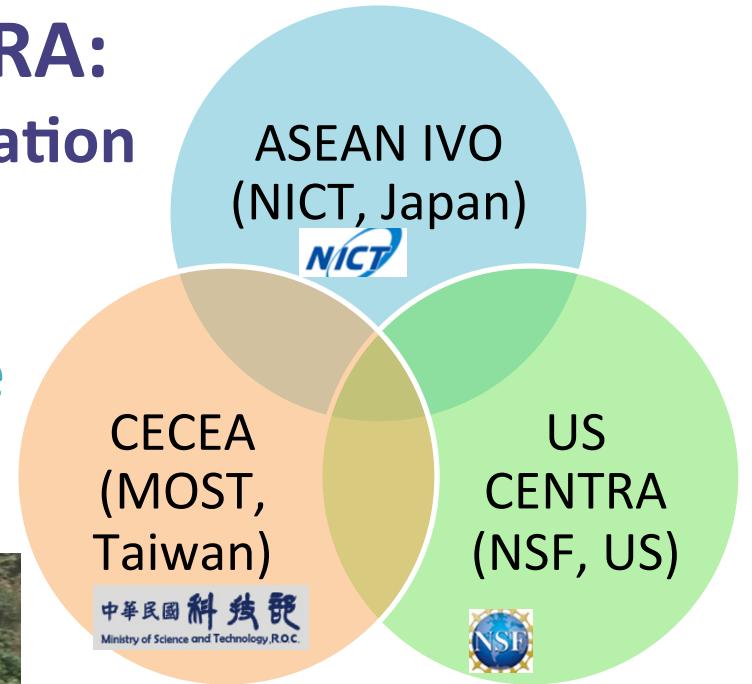
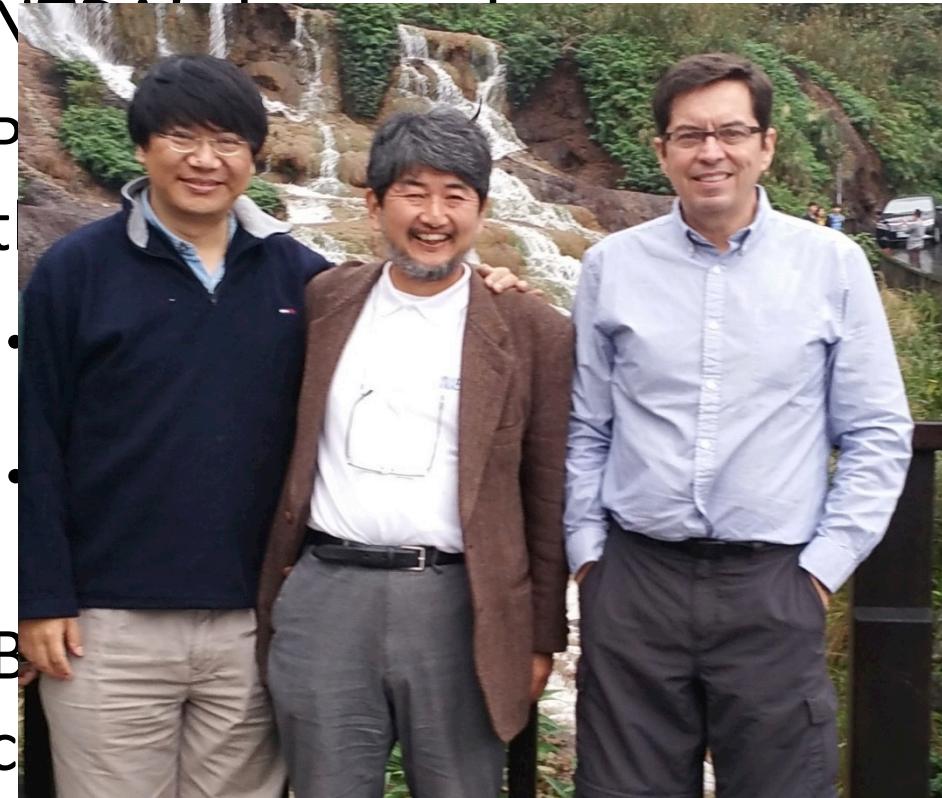
Chat (7)

This is a screenshot of a Facebook page for "AIST Interns 2016". The page has 1 like and 0 messages. It features a large group photo of about 20 people, including adults and children, posing outdoors in front of a brick building. The page includes tabs for Home, About, Photos, Likes, Videos, Posts, Manage Tabs, and + Add Shop Section. There are also sections for Status, Photo / Video, Offer, Event +, Write something..., This Week, See All, and a sidebar for Computers/Technology.



# PRAGMA and CENTRA: Frameworks for Collaboration

- CENTRA: Collaborations to Enable Transnational Cyberinfrastructure Applications
- CENTRA



communities,  
management  
systems for data-  
coordination ...



<http://globalcentra.org/>

# CENTRA Launch



CENTRA Kickoff Meeting, March 2016, Taiwan





# CENTRA Seminar

## AirBox – August 22, 2016

### AirBox: a participatory ecosystem for PM2.5 monitoring

Ling-Jyh Chen, Academia Sinica  
[cclljj@iis.sinica.edu.tw](mailto:cclljj@iis.sinica.edu.tw)



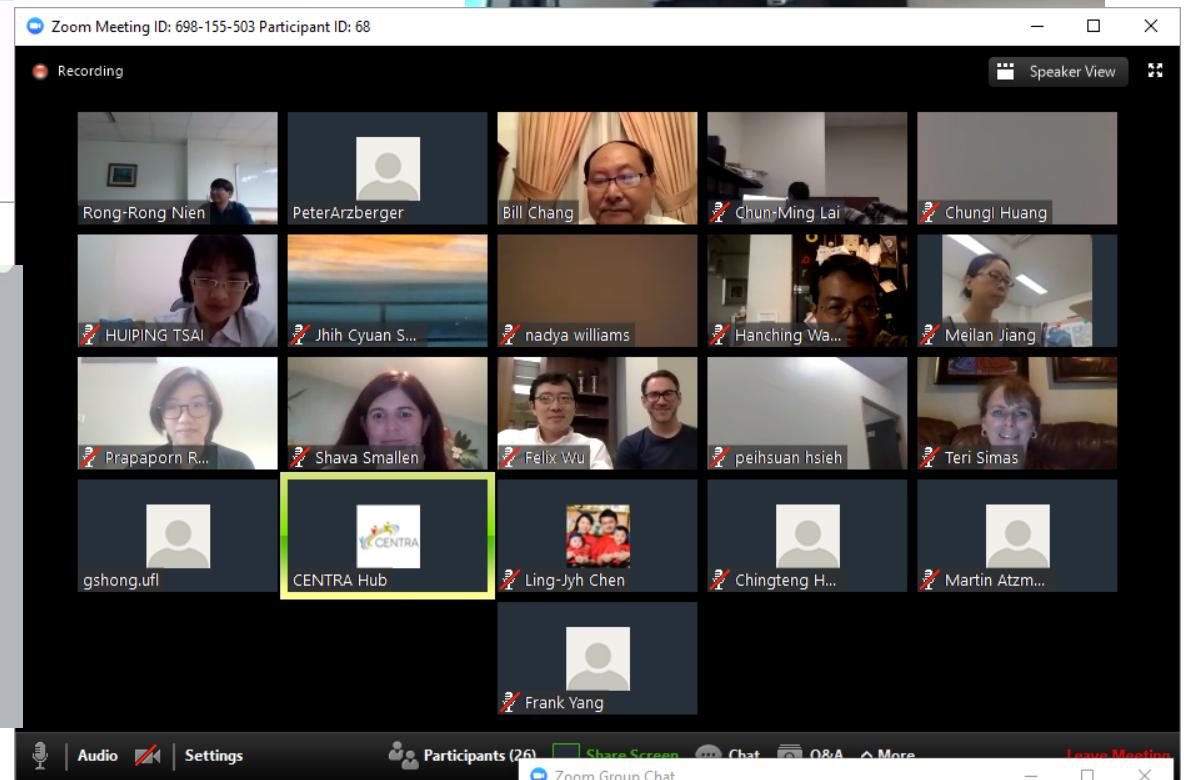
reen

Rong-Rong Nien

#### What are we going to cover in this talk?

- 1. Why is PM2.5 important?
- 2. How did we build the system?
- 3. What is the current status?
- 4. What is the next step?

Matsu  
Kinmen  
Magong  
Chu-Miao  
Yilan  
Chia-Nan  
Hua-Tung  
Ping  
Xin-Bao National Park  
Tian-Zhu National Park



# International Clouds for Data Science (ICDS)



- Special Issue: Concurrency and Computation: Practice and Experience
- Seven Papers accepted
- Themes of Research Papers
  - Use of research networks and connected local clusters that connect the PRAGMA institutions
  - Science expeditions of PRAGMA
  - Location-specific solutions via long standing and nurturing collaborative PRAGMA community



Beth Plale



Renato  
Figueiredo

D2I





Beth Plale



Renato  
Figueiredo

# International Clouds for Data Science: *Snapshot of PRAGMA 2015*

PRAGMA  
Resources  
PRAGMA  
Expeditions  
Location  
Specific

- “*Lightweight Scheduling for the PRAGMA Cloud Testbed*” by Smallen *et al.*
- “*A simple Multipath OpenFlow Controller using topology-based algorithms for Multipath TCP*” by Nakasan *et al.*
- “*PRAGMA-ENT: Exposing SDN Concepts to Domain Scientists in the Pacific Rim*” by Ichikawa *et al.*
- “*GRAPLER: A Distributed Collaborative Environment for Lake Ecosystem Modeling that Integrates Overlay Networks, High-throughput Computing, and Web Services*” by Subratie *et al.*
- “*Virtualizing Software Infrastructure for Biodiversity Expedition*” by Williams *et al.*
- “*In-Place Query Driven Big Data Platform: Applications to Post Processing of Environmental Monitoring*” by Lee *et al.*
- “*Interactive Museum Exhibits with Microcontrollers: A Use-Case Scenario*” by Wong *et al.*
- “*A Reflection on the Origins, Evolution, and Future of PRAGMA*” by Arzberger

# PRAGMA's New Website

## In Github; Easier / Faster Updates

HOME      Archive      Meetings      News      Participants      Scientific Expeditions      Students      Resources      Search

### Welcome



The Pacific Rim Application and Grid Middleware Assembly (PRAGMA) is a community of practice comprising individuals and institutions from around the Pacific Rim that actively collaborate with, and enable, small- to medium-sized groups to solve their problems with information technology. Key to PRAGMA's success is the active involvement of participants in scientific expeditions, technology development, student engagement, and outreach to new communities.

Attending our workshops is an ideal way to become familiar with what PRAGMA does, and how we interact as a community of trust. We invite you, your students and colleagues to explore this site, visit our partner sites, and attend future workshops (which do not carry a registration fee). We look forward to seeing you there!

### Scientific Expeditions

PRAGMA forges collaborative, multidisciplinary teams to address scientific questions of high societal impact. These questions define and drive PRAGMA's technology development efforts. There are three current expeditions:

- Virtual Biodiversity: Understanding adaption in extreme environments.
- Lake Ecology: Predicting impact of eutrophication on lake ecosystem services.
- PRAGMA-ENT: Creating and utilizing an Experimental software-defined Network Testbed.

### About

The Pacific Rim Application and Grid Middleware Assembly (PRAGMA) is **an international, distributed community of practice for technology and approaches that supports the long tail of science, namely**

### Quick Links

- » PRAGMA Overview
- » Benefits
- » Participants
- » Leadership
- » Sponsors
- » Contacts

### Upcoming Events

- » PRAGMA 31  
September 7-9, 2016  
Thammasat University,  
Bangkok, Thailand
- » PRAGMA 32  
April 12-14, 2017  
University of Florida,  
Gainesville, USA

# Demonstrations

## *Sharing Progress, Engaging Others*

### Testbed Research

#### Session 1

- **1. Updates for the PRAGMA Cloud Testbed**  
Shava Smallen (UCSD)
- **2. Making the Universal Image for PRAGMA Boot by Clonezilla**  
Chen-Kai Sun (NCHC)
- **3. An Implementation of OpenFlow Network Monitoring and Visualization Tool**  
Wassapon Watanakesuntorn (Kasetsart)
- **4. Overlay/SDN Hybrid System for Seamless High Performance Virtual Network**  
Kyuho Jeong (UF), Kohei Ichikawa (NAIST)

### Data and Science Research

#### Session 2

- **1. Global SQL platform on inter-cloud computing environment**  
Nakagawa Ikuo (Osaka U.)
- **2. Bringing visibility to food security data results**  
Quan Zhou (Indiana U.)

#### Session 3

- **1. EDISON 2.0: Toward a Science Platform for Online HPC Simulations in Computational Science and Engineering**  
Young-Kyoong Suh (KISTI)
- **2. Dynamic Addition of SDSC Comet and PRAGMA Cloud Nodes to a GRAPLER Pool,**  
Renato Figueiredo (UF)

# e-Science in the Cloud: Possibilities and Challenges

- Moderator
  - Jose Fortes
- Panelists
  - Philip Papadopoulos
  - Paul Hanson
  - Krisanadej Jaroensutasinee



## Ideas for the Future

# Steering Committee Meeting Topics

- Summary of and Discussion about PRAGMA Retreat and Outputs
- PRAGMA Collaborative Overview
  - Review overall content
- Update on International Clouds for Data Science (ICDS): Beth Plale (ICDS – 15 status of Special Issue in Concurrency and Computation, Practice and Experience) and Renato Figueiredo (plans for ICDS – 17)
- PRAGMA 33 and beyond
  - Future sites
  - Different approaches selecting locations

# PRAGMA

## *Many descriptors, common goal*

- Community of practice
  - Long tail of science
- Framework for collaboration
  - People drive activities
- Market place of ideas
  - Trusted environment to share
- Nurturing environment
  - Support students and participants to learn and share resources



**Advancing knowledge\* through active, collaborative engagement**

**Become Involved!**

**Become Committed!**

# **Thank You to All Organizers and Sponsors**

## ***And Thank All of You for Your Active Collaboration***

- General Chair
  - Asst. Prof. Dr. Wilawan Rakpakavong
- Chair
  - Dr. Prapaporn Rattanatamrong
- Demo Chairs
  - Dr. Jason Haga
  - Prof. Kohei Ichikawa
  - Prof. Renato Figueiredo
- Poster and Student Presentation Chairs
  - Quan Zhou
  - Chawanat Nakasan
  - Meilan Jiang
  - Pongsakorn U-chupala
- PRAGMA 31 Website Administrator
  - Ms. Pimpawan Wannasirikul
- Local Organizers
  - Asst. Prof. Dr. Wilawan Rukpakavong
  - Dr. Wanida Putthividhya
  - Ms. Sirikanya Nilpanich
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  - Asst. Prof. Dr. Putchong Uthayopas
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- Program Committee
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  - Beth Plale
  - Heru Suhartanto
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  - Jason Haga
  - Jelina Tetangco
  - Kevin Dong
  - Kohei Ichikawa
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  - Ruth Lee
  - Yoshiyuki Kido
  - Renato Figueiredo
  - Ryousei Takano
  - Sorntep Vanarat
  - Putchong Uthayapas



CNIC for Duckling

