

A photograph of a modern university building with a central tower, surrounded by greenery and a clear blue sky. The building is light-colored with large windows and a prominent central structure.

# Striving for Excellence in Research: Nagoya University's Experience Focus on Collaboration with Asian Universities

The 3<sup>rd</sup> Japan-Indonesia Rector's Conference

November 5-6, 2015

Aya Okada, Ph.D.

Associate Trustee (International Cooperation)/ Professor  
Nagoya University



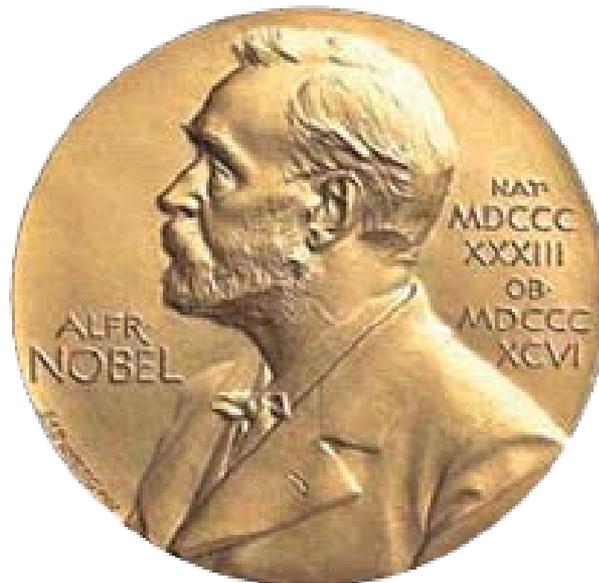
**NAGOYA**  
UNIVERSITY

# Research Excellence

**Nobel Lauretes in Physics, 2008**



**Alumnus & NU Professor:  
Dr. Toshihide Maskawa**



**Nobel Laureates in Physics, 2014**



**Alumnus & NU Professor:  
Dr. Makoto Kobayashi**



**NU Distinguished Professor:  
Dr. Isamu Akasaki**



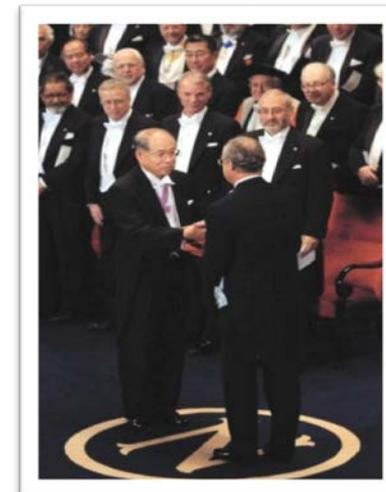
**Alumnus & NU Professor:  
Dr. Hiroshi Amano**

**Nobel Laureate in Chemistry, 2008**



**Alumnus & Former NU Associate Professor  
Dr. Osamu Shimomura**

**Nobel Laureate in Chemistry, 2001  
King Faisal Int'l Prize, 1999**



**NU Professor:  
Dr. Ryoji Noyori**

# From Innovation to Value Creation

- Nagoya University, promoting innovation and knowledge creation
  - > Based on Nagoya University's vibrant and open research culture
- New Initiatives towards becoming a World Leading University

## **Nagoya University MIRAI 2020**

- As a leading university located in one of the world's most dynamic industrial clusters, promoting research collaboration and innovation that contribute to the betterment of society
  - Solving social problems to realize a lively and sustainable society
- Open innovation for sustainable growth of Japan, Asia, and the World
  - ◆ World-Leading Automobile Industry (NU COI theme)
  - ◆ Next-Generation Automobile and Aircraft Parts Industries (NCC)
  - ◆ Energy Efficient Electronics Industry (GaN Research Consortium)



Views of Nagoya: place of vitality and history



# Competitive Research Environments

## External Funding for Research & Education

FY 2013

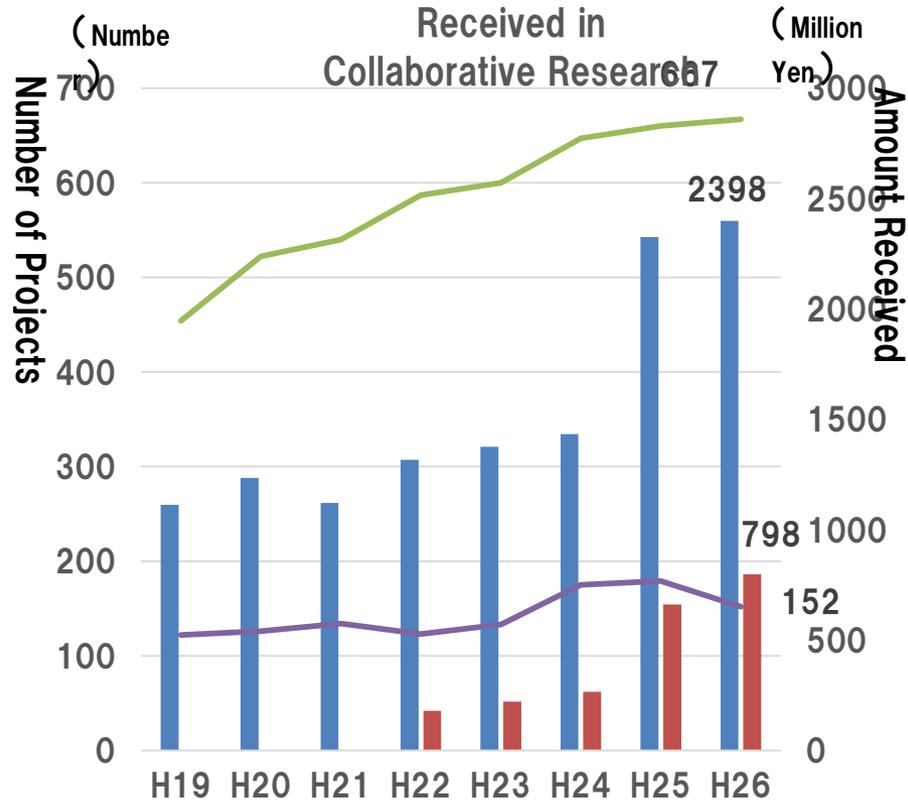
Types of Funding	Number of Projects	Amount (in thousand yen)
Grants-in-Aid Scientific Research	2,811	7,987,816
Other Governmental Grants	236	11,525,208
Donations and Commissioned Research	3,758	13,636,316

As of May 1,, 2014

Research human resources	Number (regular staff)	Number (fixed-term)
Professors	672	64
Associate Professors	503	99
Associate Professors/ Lecturers	107	109
Assistant Professors	412	310
Research Associates	7	0
Researchers	0	196

# Status of Collaborative and Commissioned Research

## Changes in Number of Projects and Amount Received in Collaborative Research



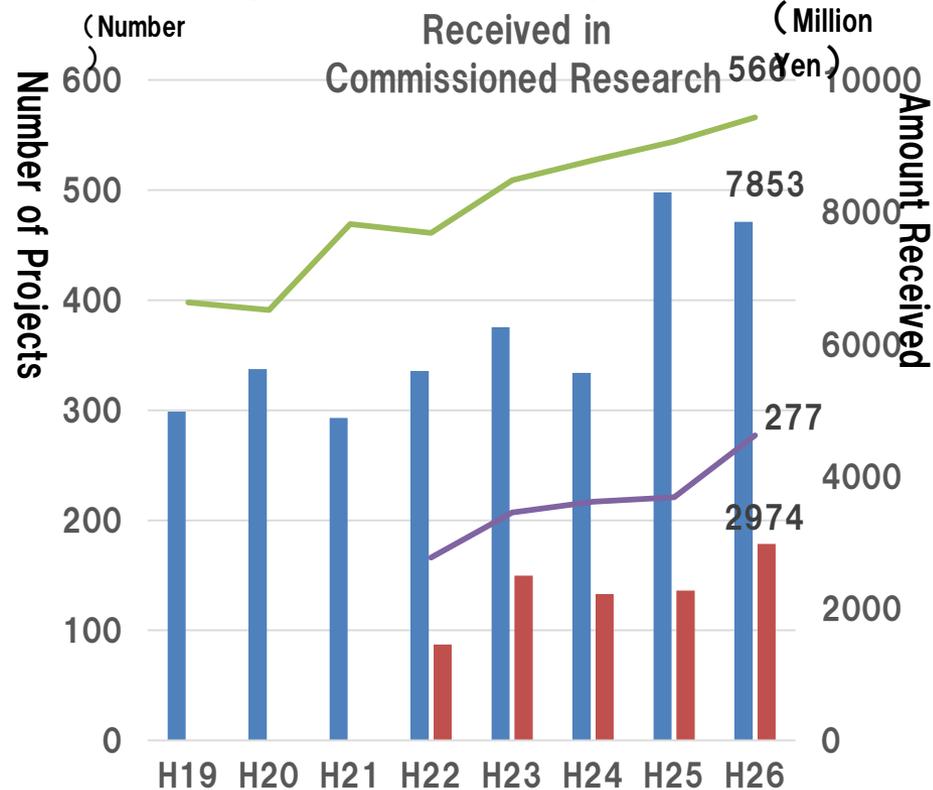
Amount Received フナ Life Sciences  
Number イフサ Life Sciences Only

Note: Amount received based on accounting data

Per Research: 3,595 (Thousand Yen)

6 National Average: 2,422 (Thousand Yen)

## Changes in Number of Projects and Amount Received in Commissioned Research



受 Amount Received Life Sciences  
件 Number Only Life Sciences

Note: Numbers exclude clinical trials and pathological tissue tests  
Amount received based on accounting data

Per Research: 13,875 (Thousand Yen)

National Average: 7,612 (Thousand Yen)

# Development of **molecules** to "understand", "see", and "regulate" living organisms



## Control of Biological Systems

- Plant growth & development
- Plant/animal reproduction
- Biological clock

## Visualization of Biological Systems

- Novel molecules and methods for bio-imaging & bio-sensing

## Synthesis of Bio-Functional Molecules

- New catalysts and reactions



**MERGING** synthetic/catalysis chemistry, plant/animal biology & theoretical chemistry

**BASIC SCIENCE APPROACHES** towards global issues of food/biomass and energy

# Toward Globally Visible Institute

## Partners

NSF Center for Selective C–H Functionalization (USA)



RIKEN Center for Sustainable Resource Science (Japan)

see Appendix for details



Plant Science, Chemical Biology, Natural Product, Biomass, Catalysis



Many others (Germany, Canada, Korea, etc)



# COI(Center of Innovation)

Less traffic accidents and burdens for elderly drivers

## 1 Safety & Security

Driver-assisted system to prevent car accidents and relieve anxiety by understanding human factors of the elderly.

Safety &  
Security

安心

A "Mobility Society" for the Elderly:  
Leading to an Active and Joyful  
Lifestyle



Let's Go Out!

Create services and activities in which the elderly are willing to participate.



Active

Conn-  
ection

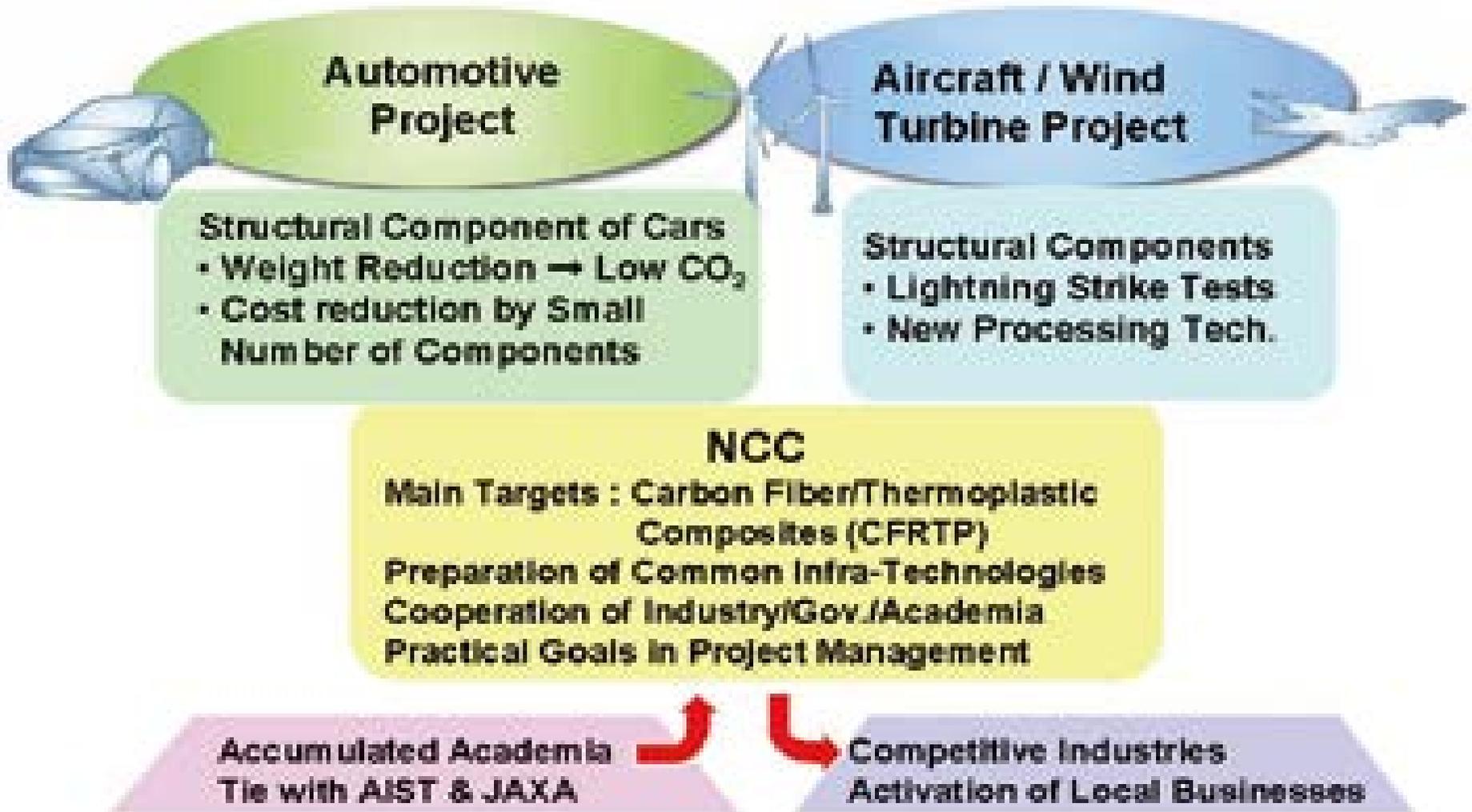
3 Let's be active!

Establishment of transportation infrastructure, systems, services and a supportive community to create and maintain active lifestyles of the elderly.

Promoting an active lifestyle for elderly people

Establishing a model  
community

# National Composites Center (NCC)



# GaN Research Acceleration (in planning)

- Expedited realization of “Energy Efficiency Innovation”,
- Promoting the “Creation of a System of Open Innovation”
- Research on Gallium Nitride (GaN) by Professor Amano
- Creation of All-Japan research consortium

## Strengths of Nagoya University

- World leading research outcomes in GaN Semiconductor Research by Special Professor Akasaki and Professor Amano, etc.
- Various world leading observation devices such as Ultra-High Voltage Electron Microscopes, Synchrotrons, etc.



## Energy Efficiency Innovation

- “Energy Efficiency Innovation” through cutting-edge technology is the secret weapon for Japanese economic growth
- Establish a place in the growth strategy and increase efforts, thereby significantly reducing the time required for its implementation and serves as a strong traction for the Abenomics strategy

### **【Objective】**

Decrease the amount of national electricity consumption by 15%, including a 7% decrease by promoting LED lights, by the time between 2025 and 2030



## Research Collaboration between Nagoya and Indonesia



### (1) Start at Aceh Tsunami Disaster in 2004 Dec.

- ▶ Emergency joint research team of Nagoya in early 2004 :

Environment studies, Development studies, Earthquake-volcano research center, Engineering

### (2) Subsequent disasters in Indonesia:

- ▶ Central Java in 2006
- ▶ West Sumatra in 2009
- ▶ Mt. Merapi eruption in 2010

### (3) Development of comprehensive disaster research projects

Project List (selected):

- Comprehensive quake-volcanic disaster prevention policy (2008-10)
- Social mechanism of suffering, response and rehabilitation of Tsunami (2008-10)
- Rehabilitation strategy and risk control in developing countries.(2011-14)
- International comparative research of huge quake disaster (2015-18)

## Current Academic Research Network

Nagoya Univ.



- ▶ Development studies
- ▶ Environmental studies
- ▶ Earthquake-volcano research center
- ▶ Mitigation research center.
- ▶ Engineering

▶ Gadjah Mada Univ.

- Geography
- ▶ Bandung Inst. of Tech.
- Geoscience
- Social sci.
- ▶ Syah Kuala Univ.
- ▶ Indonesia Inst. of Sci. (LIPI)
- Center for population research



# ASEAN Political-Security Community Building



Enhance rules and good governance

Enhance integration for safety

Enhance wellbeing and livelihood

Narrowing the Development Gaps

Outcome:  
*Human Security in Southeast Asia* (2010)  
 "The ASEAN way and Asian regional security"  
*Politics and Policy* (2007)



## Security in Southeast Asia in the Changing World

aims;

- To identify the ways to **develop realistic inter-governmental mechanisms** to tackle transboundary security issues, such as human and drug trafficking.
- To develop a **functional dispute management mechanism** in Southeast Asia.
- To conceptualize **the ASEAN way** of maintaining peace and security.
- To review and reassess **the regional cooperation in Asia** for security in the era of **rising China and India**, and in the multipolar world.

Conducted in Cooperation with;

- Centre for Strategic and International Studies (Indonesia)
- Nanyang Technological University (Singapore)
- Institute of Human Rights and Peace Studies (Mahidol Uni., Thailand)
- Southeast Asian Conflict Studies Network (Uni. of Sains, Malaysia)

# The JSPS AA Science Platform Program

## *Skills Development for the Emerging New Dynamism in Asian Developing Countries under Globalization*

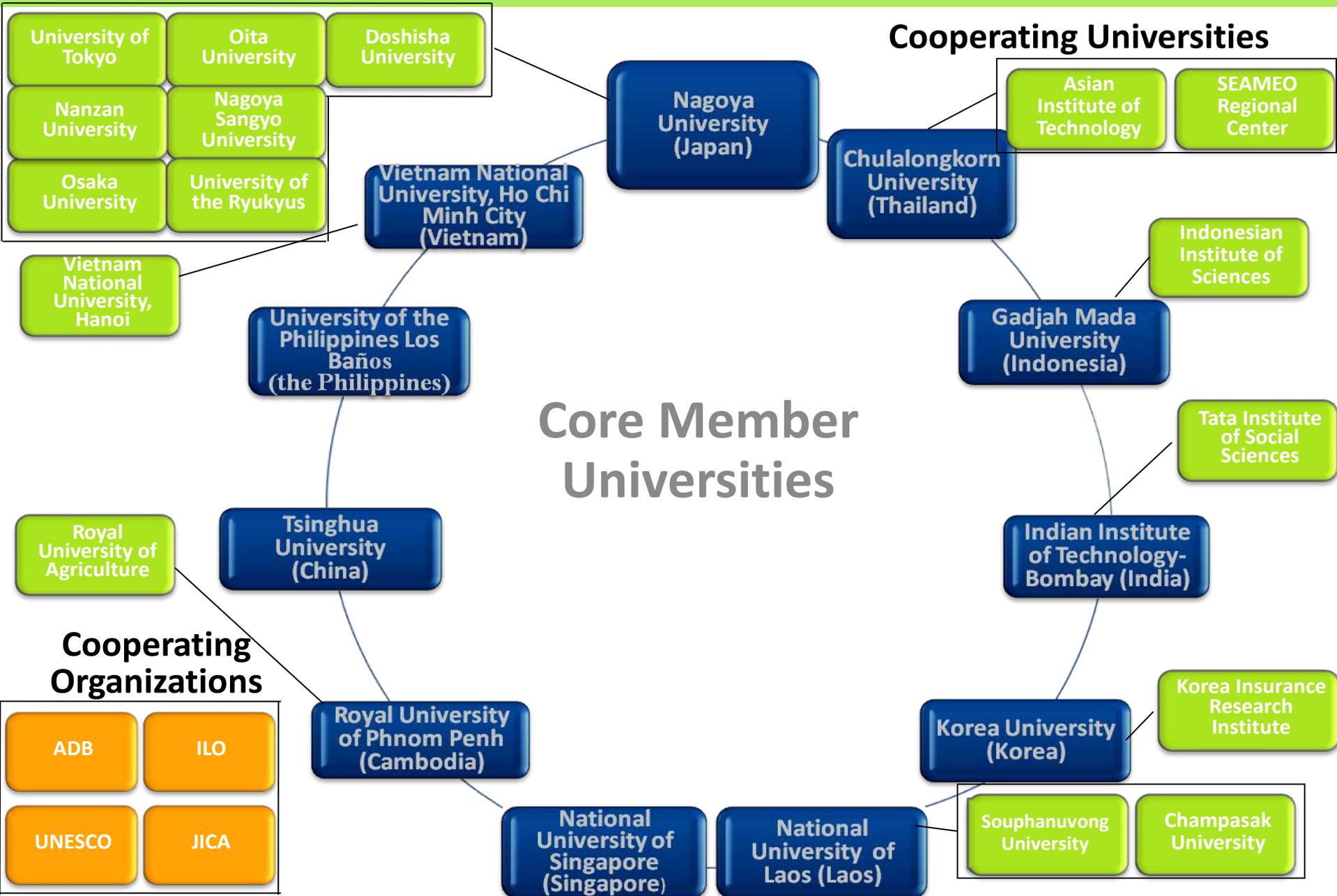
**R-1: The Impact of Globalization and Changing International Division of Labor on Asian Developing Countries**

**R-2: Changes in Socio-economic Structures in Asian Late Developing Countries**

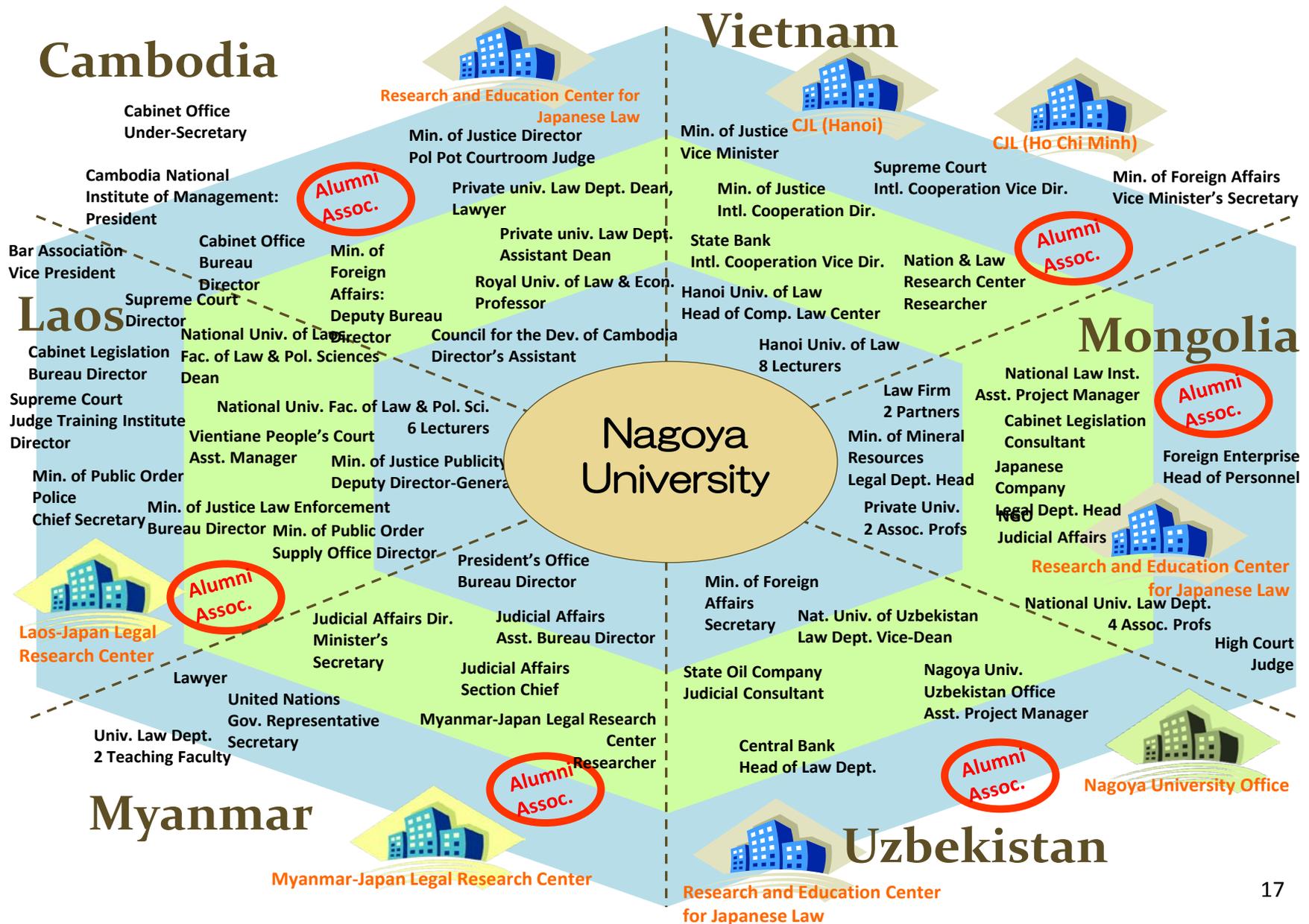
**R-3: Skills Development for Sustainable Economic Development in Asian Late Developing Countries in the Global Age**



# Academic Network for Development in Asia (ANDA)



# Graduates Network



# Nagoya University Asian Satellite Campuses Institute



: Satellite Campus (SC)

Launched in 2014, in preparation to be launched in 2015  
in preparation to be launched in 2016

< Graduate schools to provide education at SC



Law



Medicine



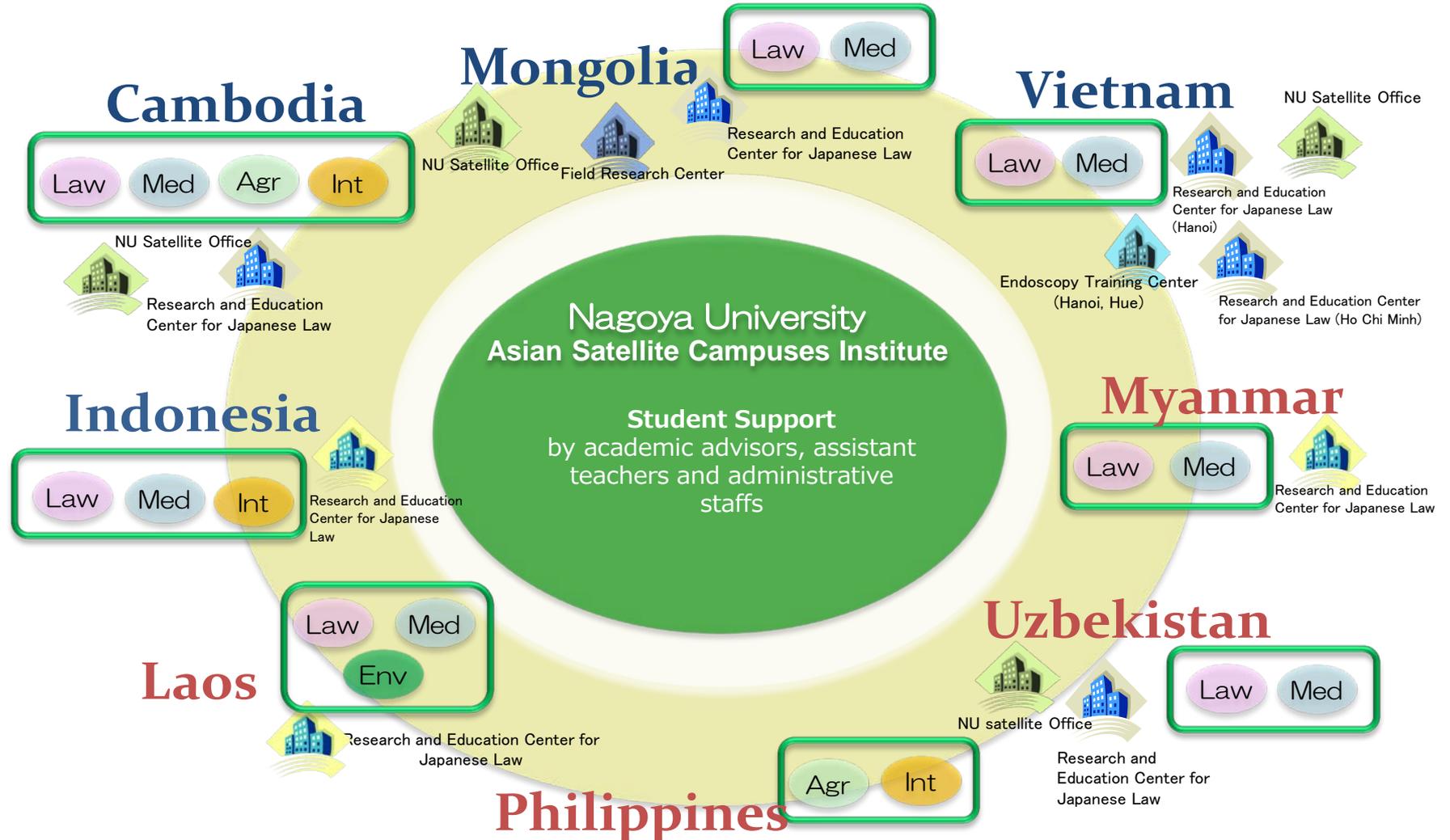
Bioagricultural Sciences



Int'l Development



Environmental Studies



# Nagoya University's ASEAN Research Net

With Problem-Solving Approach to Research to Respond to Contemporary Social Issues Common in Asia

## Issues Commonly Faced by Asian Countries For Reducing Disparity and Building Competitiveness

- Persistent Poverty and Disparity
  - » Poverty reduction, gender equality, access to education, cultural diversity
  - » Sustainable Development
- Capacity Development for Local Economic Development
  - » Industrial Cluster Development, Development of Local Innovation System

## Nagoya University ASEAN Research Net

### Challenges of ASEAN Regional Integration

For Learning with Asia for Sustainable Development

- Legal Institutional Building for ASEAN Regional Integration
- Development of Leaders with Broad Perspectives and Appreciation of Diverse Values
  - » CAMPUS ASEAN Projects, Program for Leading Graduate Schools, ASCI
  - » Development of Innovation Human Resources
- Promotion of Cross-Cutting Research drawing from ASEAN
  - » Multi-layered research networks across ASEAN
  - » Joint research based on experiences and lessons from Asia

### Global Issues

For Building Sustainable World

- Increase in Cross-national mobility of people
  - » Development of Health System, Improvement of Medical Technologies
- Environmental Issues due to rapid economic development
  - » Environmental protection
  - » Increase in agricultural production and food self-sufficiency,
- Prevention and management of natural disasters
  - » Simulation of damage due to natural disasters
  - » Post-disaster recovery and rehabilitation, resilience

## Building on Nagoya's Strengths, Strengthen Research Networks with ASEAN to Promote Open Innovation for Sustainable Development

### NU ASEAN Research Net

Law    Medicine    Engg    Bioagri    Intl Dev't    Environment    Other

- Collaborating with ASEAN Universities
- Extensive Research Networks with International Organizations, Research Institutes in ASEAN

Nagoya University



Strategic Support to Research Activities across Diverse Disciplines in Research Hubs in Each Country



#### Thailand

Engg.    Medicine.

- Automobile,
- Cancer diagnosis with endoscope,



#### Myanmar

Medicine.

- Cancer diagnosis

#### Singapore

Law.

- Legal Institutional Development for Regional Integration

#### Laos

Environment

- Joint research on environmental harmonization between human lives and environments



#### The Philippines

Bioagri.

- Food security, environments, and crop production

#### Indonesia

Int'l Dev't

- Industrial policy, poverty, equality, gender

Thank you!