Making the most of our intellectual partnerships

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Toyoda Auditorium, donated by the Toyota Motor Corporation
Today’s Topic

- Members of AC21
- Mission of AC21
- Events
  - International Forum, Student forum
  - Weak involvement by industries
- Member universities and industries
- Examples of collaboration between University and Industry

Blue LED: Professor Akasaki
  
  Automotive area: Green Mobility Cooperative Research Center
Organization of Office of Technology Transfer

President

Chief Director (Vice-President)

Headquarters Assembly for Industry, Academia and Government Cooperation

Conference for Planning of Projects

Headquarter Unit for Office of Technology Transfer

Promoting Cooperation Section

Intellectual Property Section

Promoting Entrepreneurship Section

International Technology Transfer Section

Cooperation

Faculties

Graduate Schools

Research Centers

Research Institutes

Hospital
University-Industry Collaboration

• Two-way flow of resources, funds, seeds and ideas between research and market
• Focus on practical application/commercial viability
• Synthesizing knowledge in diverse areas
• Accelerating the speed of collaborations
• Capacity development of researchers and staff for R&D
Academic Consortium 21
The Global University - Architect of the New Century

Foundation: June 2002
Activities
- International Forum
- Student World Forum
- Benchmarking Activities
- Research Cooperation
- On-line Language Education Program
- University-Industry Relations
- Other Initiatives
Academic Consortium 21
Member Universities

Chemnitz University of Technology (Germany)
Chulalongkorn University (Thailand)
Gadjah Mada University (Indonesia)
Huazhong University of Science and Technology (China)
Kasetsart University (Thailand)
Nanjing University (China)
National University of Laos (Laos)
North Carolina State University (USA)
Northeastern University (China)
Peking University (China)
Shanghai Jiao Tong University (China)
Stellen Bosch University (South Africa)
The University of Adelaide (Australia)
The University of Freiburg (Germany)
The University of Minnesota (USA)
The University of Strasbourg (France)
The University of Sydney (Australia)
Tongi University (China)
The City of Nagoya

Outline of Nagoya

- Located in the center of Japan, Nagoya is the heart of the country’s business & industrial network.
- 1 ½ hours to Tokyo; 50 mins to Osaka/Kyoto
- 4th largest city in Japan with a population over 2,150,000

Industry

- Best known as an industrial powerhouse - Home of Toyota Motor Corp., Denso, etc.
- The Chubu (Central Japan) region accounts for approximately 60% of Japan’s trade
- The city has a GDP ranked 18th in the world, ahead of many countries (Turkey is #17 and Belgium is #19)
About Nagoya’s Industry

Aircraft
- 35% of Boeing 787’s aircraft body is manufactured in Greater Nagoya

Automobile
- Center of the automotive industry

Bullet train
- Bullet train is also manufactured in Nagoya area

Source: GREATER NAGOYA INITIATIVE
NU-Academic-Industrial Alliance

Nagoya University

Kawasaki Heavy Industries, Ltd.

ADVANCED INDUSTRIAL SCIENCE AND TECHNOLOGY (AIST)

MITSUBISHI HEAVY INDUSTRIES, LTD.

TOYOTA

Global Kawasaki, working as one for the good of the planet

Global Kawasaki, working as one for the good of the planet
Achievements of Nagoya University (1)

Blue Light Emitting Diode
Prof. Isamu Akasaki

High performance Blue LED was produced by using a compound semiconductor GaN (gallium nitride). The GaN semiconductor is used for illuminant and expected to be used for high-speed, high-output transistors indispensable for the next generation ICT.
Blue Light Emitting Diode
Most Successful Business Model relating to the Collaboration among University, Industry and Government

Japan Science and Technology Agency
Fund : 5.5MUS$

Joint Development
1987

1990
1995

Commercialization
Toyoda Gosei Co., Ltd.

Akasaki Institute

Nagoya University

Effect
350 Billion Japanese Yen (3.5 Billion US $)
32 Thousand People Job Creation
Scale of Applied Product
3,600 Billion Japanese Yen (36 Billion US$)
Nagoya University

Green Mobility Cooperative Research Center

NU-Academic-Industrial Alliance
• **Established** on July 2011

• **Mission**
  to develop transportation device and system for ecology and human life with a future, and cultivate young researchers for next generation.

• **Location of Nagoya**
  Biggest manufacturing base, automobile, airplane and train.

In such fields, new technology for ecology and human life is necessary. Nagoya University put together the academic seeds to the center and challenge the generation of new technology with development risk.
Outline of Green Mobility Cooperative Research Center

By consolidated wisdom of Nagoya University on Green Mobility Engineering, Green Mobility Research Groups are set up. World-class research on environment, energy, safety, security, robotics and control system is to be enhanced to top edge through this foundation, and the outcome has to be provided to society through cooperation of university with outside and education.

**Education**

*Effective use of education potential of each school*
- Training for professionals for production and manufacturing
- Business person training
- High level IT specialist training
- Re-education (Post graduate)

*Education to international expertise*
- International automobile engineering education
  - Summer program (NUSIP)
- Top class scientists from world to Nagoya

**R & D**

*Green Technology*
- Battery, Light weight, Fuel, Smart recycle

*Technology for high performance*
- Built in system, Robotics

*Safety and Security Smart Community*
- “0” Traffic accident, ITS, New transportation system, Carbon offset, Tax

*Promotion of Big National Project*

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Graduate School of Engineering
- Environment Study
- Information Science
- Economics

Eco-Topia Science Institute

Institute of Backcast Technology on Materials

International Research Center for substantial Transport & cities

Center of Embedded Computing systems

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Academia- Academia Collaboration
- No.1 in the world
- Transmit environment friendly mobility technologies

International Collaboration
- Creation of Innovation
- Till 2025 create new business as conning tower of all Japan

Industry- Academia Collaboration
- Contribution to Society
- World-class personnel
Green Mobility Cooperative Research Center

Research division
- Materials
- Bio-mechatronics
- Power Train
- Intelligent Transport System

Training division
- Refresher Course

Education
- Dept. Eng.
- Dept. IT.
- Dept. Env.
- Dept. Economics

200 Graduate students

Summer School
Automobile Technology Course

Materials Research Lab
50 Researchers From Industry

50 Researchers
Interdisciplinary and Integrated

**Fundamental**

- Elementary Technology
  - Battery Materials
  - Lightweight Materials
  - Power Devices
  - Magnetic Materials
  - Rare metals & Rare-earth
  - Sensing

- System Technology
  - Regulating System
  - Human Factor
  - Embedded Software
  - Motor
  - ITS・City Plan
  - Mechatronics

**Interdisciplinary**

- EV/FC
  - *Long distance
  - *Ubiquitous Charge
  - *Rare-metal Free

- CO2 Reduction
  - *Steel/Composite
  - *Jointing

- Safety and Comfort
  - *Integrated ITS
  - *City Plan

- ITS・City Plan
- EV/FC
- Rare-earth Free
- Motors
- *Motors
- *Jointing
- *Steel/Composite
**Project Sample** Materials for Energy

**NU Future’s Target**

- **NanoCluster**
  - NC-Catalysis without rare metals
  - NC-Dispersal Medium for cooling

- **Super-lightweight**
  - Thermoplasticity nanocomposites
  - Jointing steel to nanocomposites

- **Reduce**
  - From dust to functional materials
  - For energy

**NU Advantages**

- Electron-Atom-Molecule Behaviors
- **Nano Particles**
- **Crystal Growth**
- **Steel**
- **Reduce**

**NU Synchrotron Facility**

- High-Voltage TEM
Project Sample Integrated Smart System for Automobile

 NU Future’s Target
☆ Noncontact sensing
☆ Embedded Software working with others
☆ Demonstration experiment

Extensive Database

NU Advantages
Human FC Analysis

Information from automobiles and city

CO2 Reduction & Safety

NU Advantages
Embedded Software

Probing

Five senses

Information

Physical ability

Sensing

NU Advantages

☆ Sensing
☆ Embedded Software
☆ Noncontact sensing
☆ Human FC Analysis
Cultivation of Human Resources

Coordination with industrial and global partners

From the world

HUB-Center

International Sensibility

Automobile
Airplane
Industry

Advanced Technology

Global Research Partners

Global Industrial Partners

Human Resources

To the world
Forum for Aerospace Industry

Enhancing aerospace industry in Japan by consolidating and developing aircraft equipments manufacturers – at the launch of MRJ (Mitsubishi Regional Jet) project

Forum for Aerospace Industry

Materials manufacturers

Aircraft hull manufacturers (MHI, KHI)

New comer manufacturers

Interior equipments manufacturers

Providing support

Industry

Chubu Economic Federation
C-ASTEC (Chubu Aerospace Technology Center)
Manufacturers

Universities

Nagoya University

Governments

Chubu Bureau, METI
Local governments

MRJ (Mitsubishi Regional Jet)
- The next generation regional jet (70-96 seats) made with cutting-edge technology
- A new proposal from Japan to the world’s aircraft market

METI (Ministry of Economy, Trade and Industry)
The Society of Japanese Aerospace Companies
Tokai Manufacturing Project
NCC (National Composite Center)

Established in Nagoya University
Processability of Composite material including CFRP
Scale of Fund  24million US$
Application to Airplane, Automobile

*International Collaboration
UK, Germany and Australia

Large press machine
Apparatus for testing thunder
Extruding machine
Apparatus for testing fire
Proposal

• Joint Collaboration among AC21 members on specific themes including industries

• Set-up of Working Group
  • Work shop
  • Seminar
• Exchange of faculty and students
Thank you

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