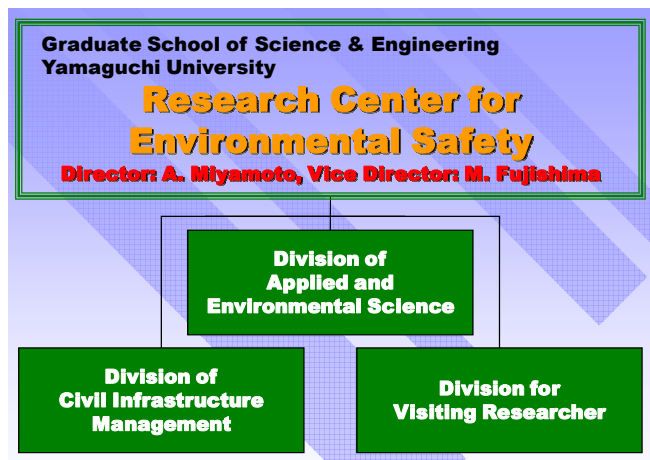


Graduate School of Science & Engineering, Yamaguchi University

NEWSLETTER OF RESEARCH CENTER FOR ENVIRONMENTAL SAFETY *No 1 (March 2008 issue)*

● **Introduction of the Research Center for Environmental Safety**

The establishment of the Research Center for Environmental Safety (RCES) of Yamaguchi University was authorized formally by Graduate School of Science & Engineering of Yamaguchi University on January 2008, to build up rationally and worldwide the framework for a sustainable civil society. Because the lifetime management for infrastructure systems as an environmentally-friendly system is becoming one of the most important issues in safety & securer civil societies to be carried over into next generation for not only in advanced countries but also in developing countries, through creating and applying science & technology, we actively try to enhance the global competitiveness of engineering and other fields, and thus increase the possibility of the sustainable civil society. The RCES has three divisions that will be able to provide research, development, testing & information for all over the world related to the fields, as shown in right Figure.



● **GOALS & ROLES**

1. Division of Civil Infrastructure Management

[Goal] To develop an integrated lifetime management system for infrastructures combined with the latest information processing technologies and intelligent health monitoring techniques, while establishing the “INFRADOCTOR”.

[Staffs & research fields] A.MIYAMOTO (*Prof., Dr Eng., Structural Diagnosis*), K. ICHIHARA (*Prof., Dr Med., Laboratory Medicine*), H. NAKAMURA (*Prof., Dr Eng., Structural Maintenance Engineering*), K. KAWAMURA (*Assoc. Prof., Dr Eng., Applied Systems Engineering*), Y. MIZUNO (*Assoc. Prof., Dr Eng., Applied Informatics Engineering*)

2. Division of Applied & Environmental Science

[Goal] Subdivision of “Utilization of Biological Functions” is aimed to prevent and restore various damages in the ecosystem caused by public infrastructure maintenance activities and global warming, using organisms with specialized functions. Subdivision of “Membrane Science and Engineering” is aimed to apply nano-structured molecular sieve membranes to environmental areas and future energy development.

[Staffs & research fields - Subdivision: Utilization of Biological Functions] M. FUJISHIMA (*Prof., Dr Sci., Evolutionary Biology*), M. MIYAKAWA (*Prof., Dr Sci., Cell Biology*), K. MATSUI (*Prof., Dr Agric., Plant Ecosystem Science*), K. FUJII (*Assoc. Prof., Dr Fish. Sci., Environmental Microbiology*)

[Staffs & research fields - Subdivision: Membrane Science and Engineering] H. Kita (*Prof., Dr Eng., Membrane Science*), K. Tanaka (*Prof., Dr Eng., Chemical Engineering*), K. Uemura (*Assoc. Prof., Dr Eng., Inorganic Chemistry*), K. Okamoto (*Prof., Dr Eng., Polymer Chemistry*)

3. Division for Visiting Researcher: Through genuine cooperation with excellent visiting professors and researchers as well as ours, it makes fruitful values and information related the sustainable civil society to all over the world.

● MAIN STAFFS

The following staffs are attending to the Research Center as main research members:



–Director–
Dr. Ayaho MIYAMOTO, Prof.



–Vice Director–
Dr. Masahiro FUJISHIMA, Prof.



–Vice Director–
Dr. Hidetoshi KITA, Prof.

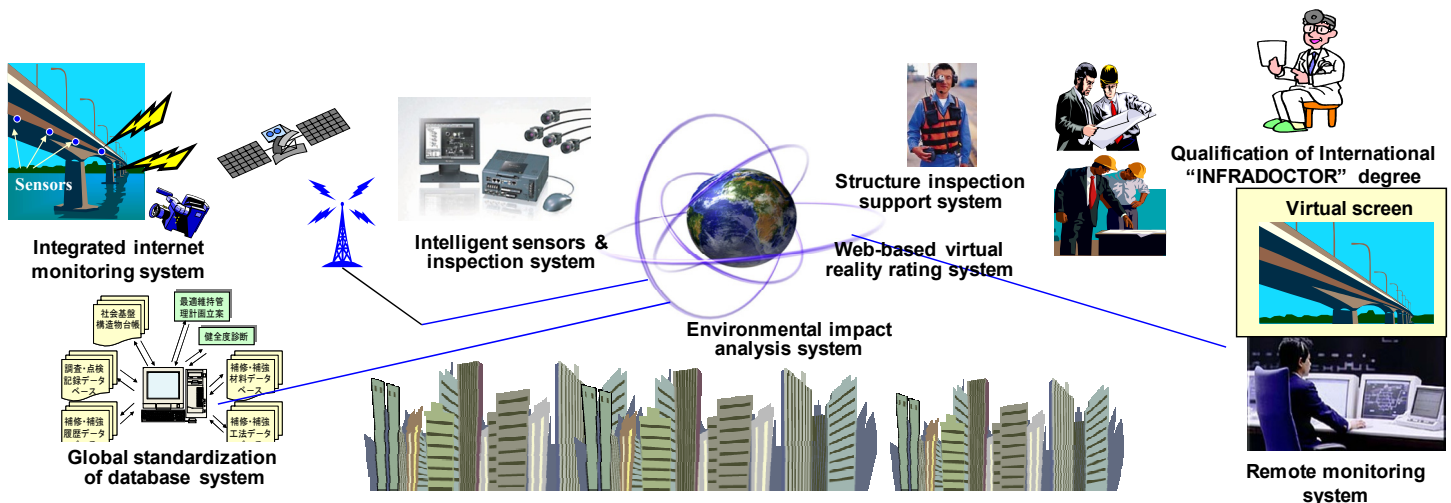
● MISSION & CORE VALUES

The mission and core values for each division in the Research Centre at present are described below and schematically shown in the following figure:

Division of Civil Infrastructure Management

--- Genuine Cooperation & Engineering-based Innovation on the field of sustainable civil society ---

- ① Integrated analysis of diagnostic parameters monitored from existing structures and global standardization of the data format,
- ② Rearrangement of the diagnostic and repair/strengthening technologies, and applicability investigations for foreign countries,
- ③ Damage data (include digital image) acquisition for Database System and Application of the image processing technologies to quantitative damage assessment,
- ④ Development of knowledge acquisition system regarding progression of structural damage using the latest image processing technologies,
- ⑤ Development of an education system on management of infrastructure damages making use of advanced information technology and virtual reality techniques,
- ⑥ Release of a prototype Web-based internet system for J-BMS Database System, Integrated Lifetime Management System (J-BMS) and Automatic Crack Recognition System of infrastructures,
- ⑦ Organization of international conferences on lifetime/maintenance engineering, and
- ⑧ Others.



Civil infrastructures for safety & securer society to be carried over into next generation

Division of Applied & Environmental Science

Utilization of Biological Functions

Application of Organisms Having Special Functions for Prevention and Restoration of Damages in Ecosystem Caused by Public Infrastructure Development/Maintenance and Global Warming

Damaged Ecosystem

Polluted Aquatic Environment

Restore of Stable Ecosystem

Use of Stress-Resistant Protozoa by Endosymbiosis

Maintenance of Water Quality

Use of Yeasts with Specialized Metabolic Functions

Maintenance of Stable Plant Ecosystem and Recovery of Plants from Damages

Use of Bioactive Organic Chemicals Excreted by Plants

Ethanol Production from Non-edible Biomass

Use of Polysaccharides-Degrading Microbes and Yeasts

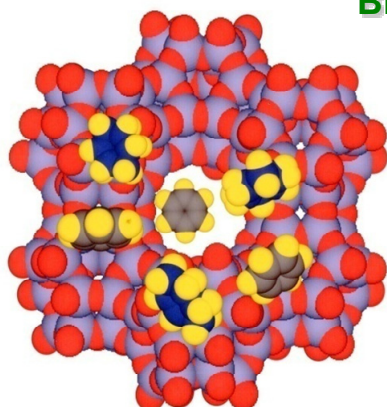


Restoration of Ecosystem

Depuration of Aquatic Environment

Membrane Science and Engineering

Application of Nanostructured Membrane to Environmental Study and Future Energy System



Nanostructured Molecular Sieve Membrane

Biomass • Unused Resources

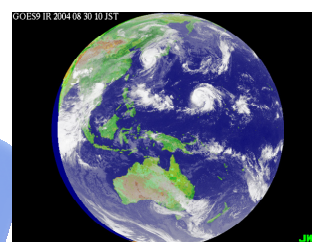
Production of Biofuel

Life time Engineering of Civil Infrastructure

Sensor Technology

Hydrogen Energy System

Hydrogen, Fuel Cell



Low Carbon Society
Cool Earth 50

Global Links
Development of Human Resources for Environmental Engineers
Promoting Next-generation Technologies for Environmental Industry

● FUTURE ACTIVITIES

The Research Center has a plan to organize the following events (Workshop/ Symposium/ Seminar etc), as the International Exchange Activities in the near future at Yamaguchi:

- ◆ 22nd(Tue)-24th(Thu) July, 2008 (3 days), under the auspices of “Practical Maintenance Engineering Institute” & “REHATEC Research Society”, “3rd International Workshop on Lifetime Engineering of Civil Infrastructure –honoring the career of Prof. S. Hamada-” will be held in Tokiwa Campus of Yamaguchi University.
- ◆ 26th (Fri) September, 2008 (1 day), under the auspices of “Infrastructure & Environmental Management Research Group” & “REHATEC Research Society”, “6th Infrastructure & Environmental Management Symposium in Yamaguchi 2008 -Civil Infrastructure and Safety Environment-“ will be held in Tokiwa Campus of Yamaguchi University.
- ◆ January, 2009(1 day), under the auspices of “REHATEC Research Society”, et al, “5th Choshu-London Memorial Symposium in Lifetime Engineering of Civil Infrastructure” will be held at University Collage London(UCL), UK.
- ◆ May, 2009(2 days), under the auspices of “REHATEC Research Society”, et al, “First Yamaguchi University-VTT Finland Joint Seminar on Automation Technologies in Structural Monitoring” will be held in Tokiwa Campus of Yamaguchi University.

3rd International Workshop on Lifetime Engineering of Civil Infrastructure

--- honoring the career of Professor Sumio Hamada ---

Ube, Yamaguchi, Japan, July 22nd-24th, 2008

HP: <http://civil.design.csse.yamaguchi-u.ac.jp/iwleci08/>

6th Infrastructure & Environmental Management Symposium in Yamaguchi 2008
Main topic: "Civil Infrastructure and Safety Environment"

26th(Fri) Sept. 2008, D-11 Lecture Theatre, Tokiwa Campus, Yamaguchi Univ., Ube, Japan

HP: <http://civil.design.csse.yamaguchi-u.ac.jp/workshop08/>