

Development of new materials and devices is a foundation that supports advanced technology. The Graduate School of Materials Science promotes 'photonic nanoscience', where the structures, properties and functions of these new materials are elucidated at the quantum (electron), atomic and molecular levels using various photons. We also conduct total engineering: to understand the interaction of light with matter; to design/create materials with many new functions; and to develop new devices.

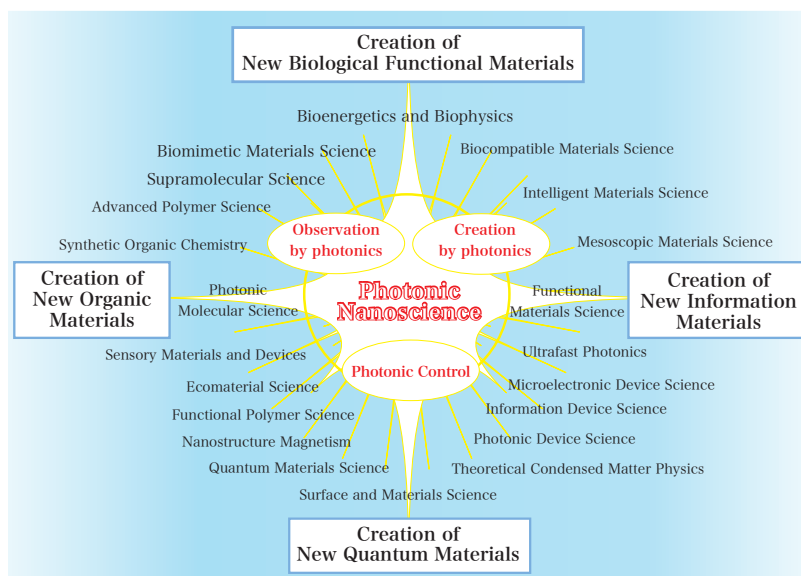
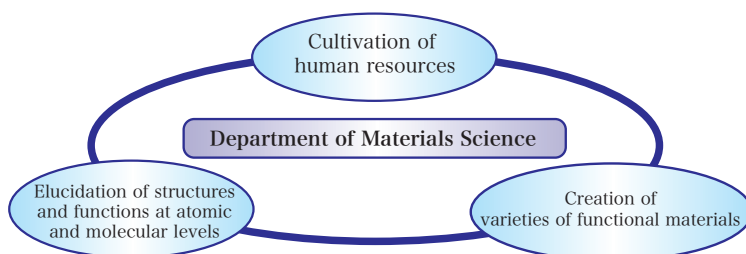
Our research will result in construction of new theory, discovery of new phenomena, creation of materials with new functions, development of new devices and technologies, and invention of innovative equipment to enrich our future. We educate students to be superior researchers who are able to participate in research and development in these areas.



NAIST[®]Topics

Japanese Photochemistry
Association Prize for Young
Scientist for 2006 Winner

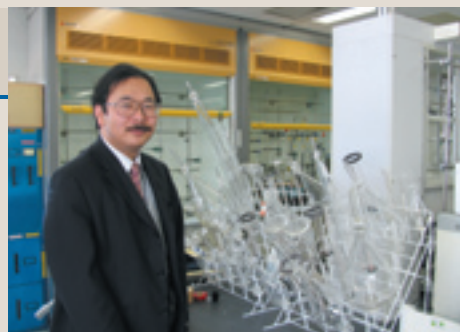
Yasuchika HASEGAWA
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Photonic Molecular Science
Graduate School of Materials Science



I am studying the creation of luminescent materials involving the combination of rare earths, such as europium ion, with organic molecules to form a complex that can glow.

By rationally designing a new luminescent molecule, we succeeded eventually in making glittering plastics incorporating luminescent materials. These plastics can emit bright green, red and yellow light. Furthermore, they can be molded into various shapes. Thus they can potentially be used for a variety of purposes, such as optic communications, displays and lighting as well as in more commercial applications like illuminations and signs.

Let me explain the design, briefly. We designed a molecule with low-vibrational "walls", which prevent thermal



relaxation. These walls play an important role in luminescent materials. We also attached a photosensitized antenna to enhance the emission intensity. Our strategy for the design was built up gradually, based on principles of physics and chemistry. We had to make and test dozens of molecules before we succeeded, but that made the moment all the more rewarding when we finally found one that worked.

Our university has an excellent research environment, and our facilities and equipment are world-class. There are also many international seminars, lectures and conferences at NAIST. Many students choose to come here with their own ideas after studying at other universities. This is a perfect place for students who like science and enjoy research.

● Brilliant research accomplishments supported by an excellent environment

The faculty-student ratio in our School is high. Our internationally active professors have made brilliant accomplishments and receive abundant external funds, including Grants-in-Aid for Scientific Research. We provide the latest experimental facilities for students to dedicate themselves to research and study in a spacious environment. The School includes the Research and Education Center for Materials Science, a common education and research facility on campus, to give students wholehearted support.

● Bidirectional industrial-academic cooperation

We provide fundamental courses in basic research and education in materials science, and collaborative laboratories to promote applications of new materials and development of new devices. Because researchers from external institutions, including company laboratories, teach collaborative courses the students have the opportunity to learn practical developments.

● Wide range of student support systems

Half of the students in the master's program and all in the doctoral program can reside in dormitories on campus. Scholarships and research funds are available. We provide travel expenses for students to attend overseas international conferences. There are sister school affiliations with academic institutions worldwide. Students have great opportunities to study abroad.

Department of Materials Science

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| ■ Quantum Materials Science | ■ Biomimetic Materials Science |
| ■ Surface and Materials Science | ■ Bioenergetics and Biophysics |
| ■ Theoretical Condensed Matter Physics | ■ Supramolecular Science |
| ■ Advanced Polymer Science | ■ Biocompatible Materials Science |
| ■ Photonic Device Science | ■ Photonic Molecular Science |
| ■ Information Device Science | ■ Ultrafast Photonics |
| ■ Microelectronic Device Science | ■ Nanostructure Magnetism |
| ■ Synthetic Organic Chemistry | |

Collaborative Laboratories

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| ■ Functional Materials Science
(Sanyo Electric Co., Ltd.) | ■ Functional Polymer Science
(Santen Pharmaceutical Co., Ltd.) |
| ■ Mesoscopic Materials Science
(Matsushita Electric Industrial Co., Ltd.) | ■ Ecomaterial Science
(Research Institute of Innovative
Technology for the Earth) |
| ■ Intelligent Materials Science
(Sharp Corporation) | ■ Sensory Materials and Devices
(Shimadzu Corporation) |

