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Membership of Academic Societies:

MSJ (Mathematical Society of Japan)

Research Interest:

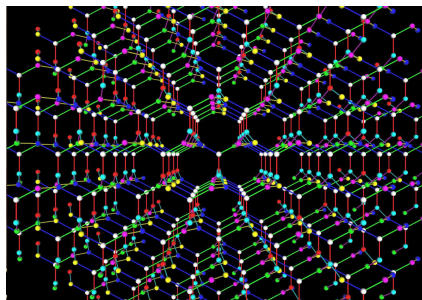
- Geometric Variational Problems
- Nonlinear Partial Differential Equations
- Discrete Geometric Analysis

Research Summary:

I am interested in “Geometric Variational Problems”. In particular, I study “Nonlinear Differential Equations with respect to Geometric Variational Problems” and “Discrete Geometric Analysis”.

Geometric Variational Problems are geometric objects defined by variational principles. For example, “Harmonic Maps” and “Minimal Surfaces” are well-known geometric objects defined by variational principles, and they are defined by non-linear differential equations. In my research, I study differential equations of above types by using their geometric properties (cf. [3]).

On the other hand, from mathematical view points. “Crystal Lattice” in Material Sciences is defined by graphs with symmetries, and they are also defined by variational principles. I also study Crystal Lattices by using geometric view points (cf. [1, 2]).



Major Publications:

- [1] M. Itoh, M. Kotani, H. Naito, T. Sunada, Y. Kawazoe, T. Adschiri, New metallic carbon crystal, *Physical Review Letters*, **102**, (2009) 055703.
- [2] H. Naito, Visualization of standard realized crystal lattices, *Contemporary Mathematics*, **484**, (2009) 153–164.
- [3] H. Naito, Finite time blowing-up for the Yang-Mills gradient flow in higher dimension, *Hokkaido Math. J.*, **23** (1994), 451–464.

Education and Appointments:

1988 Assistant Professor, Nagoya University
1995 Associate Professor, Nagoya University
2023 Professor, Nagoya University

Message to Prospective Students:

Main subject of my classroom is “mathematics by computer approach”. Examples of subjects are “Numerical analysis of differential equations”, “Computer approach for discrete geometric analysis”. In my classroom, I recommend that students does not study only methemathical theory of a subject, but should also study computational experiments them.

For that reason, I require that stundents have studied basic mathematics (eg. calculas, linear algebra), and have skill of standard programmings.