

Fluid Mechanics Group

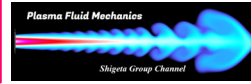
Develop Novel Methods, Visualize & Diagnose Thermofluid Processes
for Engineering Applications

Innovations!!

Our group was established in April 2021.

Find more information on **Lab. website**

and **Prof. Shigeta's Open Lecture @ Tohoku Mech. YouTube channel.**



Open Lecture [over 10k views]



Plasma Fluid Mechanics
To know Flow, to know Eddy
and
10,000K for Manufacturing

Advisors

※ Dr. Makoto Sugimoto has joined
as Assistant Professor in April 2022.

Prof. Masaya Shigeta

The Young Scientists' Prize 2014

Invited Lecturer at Gordon Research Conference
(Top level closed off-record international Conference since 1931)

Directors Member of Int. Soc. Plasma Chemistry

Advisor of EU int. project "Horizon 2020" (T)

Research Fellow at U. Minnesota & U. California (T)

Visiting Professor at U. Bologna, Italy (T)

Grant Referee for US. Dept. Energy (T)

Total **26** Awards

Students' awards with my advisory

20 awards
in 5 years

2018

- Light Metal Welding Paper Award (D3)
- J. Welding Soc. Arc Physics Award (D3)
- ICHTFF Best Paper Award (D1)

2019

- Int. Inst. Welding Henry Granjon Prize (D3)
- J. Welding Soc. Best Presentation Award (D2)
- Smart Process Soc. Encourage Award (D2)
- J. Welding Soc. Welding Physics Award (M2)
- Smart Process Soc. Encourage Award (M1)

2020

- J. Welding Soc. Welding Physics Award (D3)

- J. Welding Soc. Arc Physics Award (M2)
- ICFD Best Presentation Award (M2)
- Smart Process Soc. Encourage Award (B4)

2021

- J. Welding Soc. Welding Physics Award (D3)
- J. Welding Soc. Welding Physics Award (M2)
- Smart Process Soc. Encourage Award (M1) x 2
- J. Welding Soc. Poster Presentation Award (M2)

2022

- J. Welding Soc. Welding Physics Award (M2)
- J. Welding Soc. Best Presentation Award (M2)
- Smart Process Soc. Encourage Award (M1)

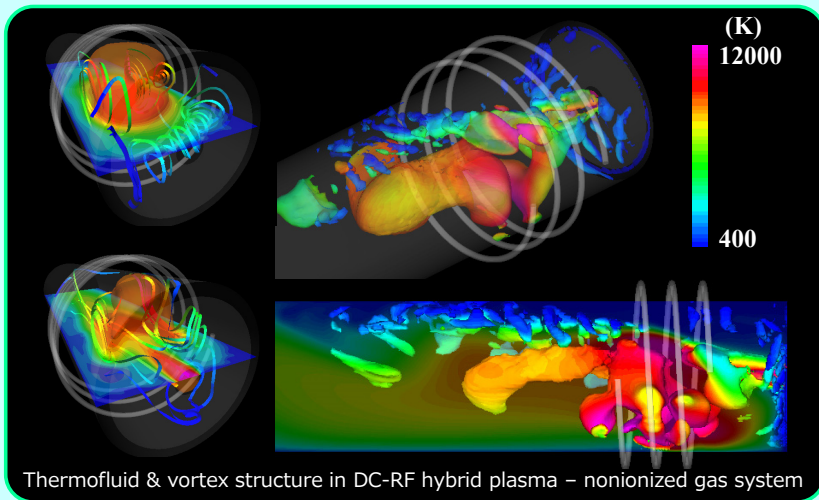
In our group

[Purpose]
Your **Version Up**

You can

- be involved in a research work at Prize/National project level.
- gain wide knowledge of Plasma, Fluid, Thermal, Electromagnetic, Chemistry, Aerosol Physics.
- polish physical sense from Plasma Fluid Mechanics.
- gain knowledge about USA & Italy from Professor's real experiences.
- You do not have to drink alcohol. (Professor does not drink.)

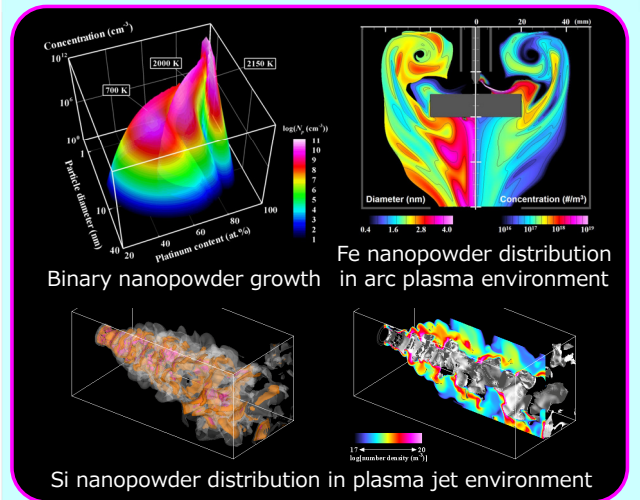
Development of flow simulation method for high enthalpy plasma – nonionized gas systems



Thermofluid & vortex structure in DC-RF hybrid plasma – nonionized gas system

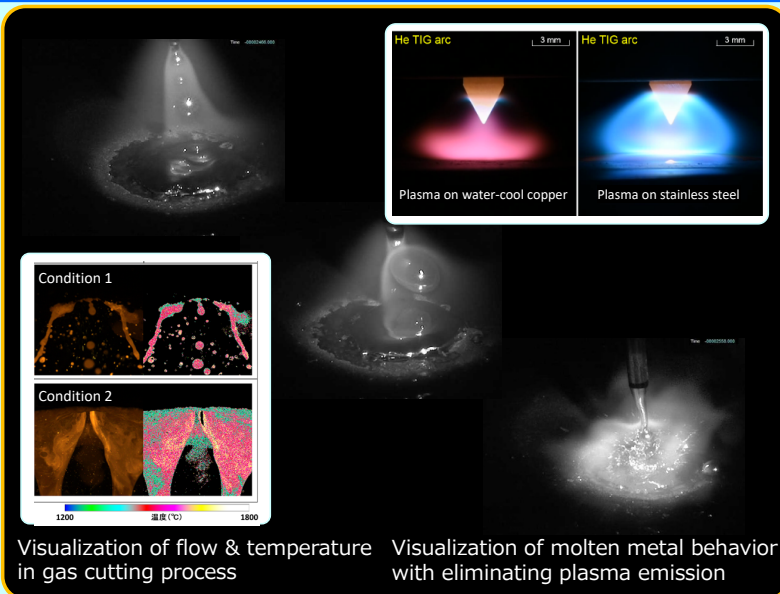
- Invited talk in Gordon Res. Conf. (only 1 Asian among 22)(2014)
- Plasma Materials Science Prize from JSPS 153 committee (2019)

Mathematical formulation & algorithm for nanopowder growth in plasma



- Invited as Visiting Professor at U. Bologna (2010)
- J. Welding Soc. Welding Physics Award (2019)

Experimental visualization measurements for high-temperature manufacturing processes

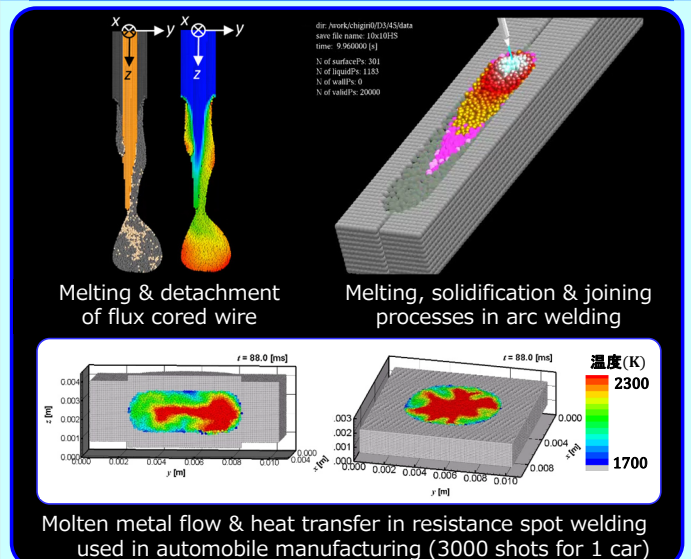


Visualization of flow & temperature in gas cutting process

Visualization of molten metal behavior with eliminating plasma emission

- 12 International Collaboration Projects (2014~2021)
- J. Welding Soc. Paper Award (2016)
- J. Welding Soc. Welding Physics Award (2016, 2020)
- J. Welding Soc. Arc Physics Award (2018)
- J. Welding Soc. Paper Award (2021) (2022)
- 14 students' awards (2017~2022)

Particle method simulation of molten metal flow & heat transfer in welding



Molten metal flow & heat transfer in resistance spot welding used in automobile manufacturing (3000 shots for 1 car)

- used in 2 national projects (2016-2022)
- 12 collab. with industrial companies (2015~2021)
- Best Paper Award at VJW(2010)
- Press releases (2018,2019)
- J. Welding Soc. Welding Physics Award (2019)
- J. Welding Soc. Arc Physics Award (2020)
- 9 students' awards (2017~2022)