

# Tahei Tahara

Chief Scientist

Director of Molecular Spectroscopy Laboratory

RIKEN

2-1 Hirosawa, Wako 351-0198, Japan

E-mail: tahei@riken.jp

TEL: +81-48-467-4592; FAX: +81-48-467-4539

## **DEGREES**

- 1984 Bachelor of Science, Department of Chemistry, Faculty of Science, University of Tokyo  
Supervisor: Professor Mitsuo Tasumi
- 1986 Master of Science, Department of Chemistry, Faculty of Science, University of Tokyo  
Supervisor: Professor Mitsuo Tasumi
- 1989 Doctor of Science, Department of Chemistry, Faculty of Science, University of Tokyo  
Supervisor: Professor Mitsuo Tasumi

## **EMPLOYMENT**

- 1989-1990 Research Associate, Department of Chemistry, Faculty of Science, University of Tokyo
- 1990-1994 Research Associate, Kanagawa Academy of Science and Technology (KAST)
- 1995-2001 Associate Professor, Institute for Molecular Science (IMS)
- 1995-2000 Associate Professor, Graduate University for Advanced Studies
- 2001-Present Chief Scientist, Director of Molecular Spectroscopy Laboratory, RIKEN
- 2003-2006 Visiting Professor, University of Tokyo
- 2004-Present Coordinate Professor, Saitama University
- 2011-2015 Visiting Professor, Indian Institute of Technology, Bombay, India
- 2017-2019 Distinguished Visiting Professor, Indian Institute of Technology, Bombay, India
- 2017-2020 Visiting Professor, Tokyo Institute of Technology
- 2022-Present Visiting Professor, Indian Institute of Technology, Kanpur, India

## **AWARDS**

Award of Research Foundation for Opto-Science and Technology (1995).

Morino Science Award (2000).

TRVS Outstanding Young Researcher Award (2001).

IBM Japan Science Prize (2004).

The JSPS Prize (2006).

Commendation for Major Contribution (A), Chief Scientist Assembly, RIKEN (2008).

Chemical Society of Japan (CSJ) Award for Creative Work (2012).

Commendation for Major Contribution (A), Core Scientist Assembly, RIKEN (2013).

Distinguished Asian Visiting Speaker Award, Univ. of Albata, Canada (2013).

Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology, Prize for Science and Technology (2017).

Spectroscopic Society of Japan Award (2017).

Distinguished Scientist Awards of the Japan Society for Molecular Science (2017).

Award for Outstanding Contribution to Raman Spectroscopy, Department of Inorganic and Physical Chemistry, Indian Institute of Science, India (2018).

Lecturer, Global Initiatives of Academic Network (GIAN), Ministry of Human Resource Development, Government of India (2019).

TRVS Lifetime Achievement Award, The International Conference on Time-Resolved Vibrational Spectroscopy (TRVS) (2019)

Mizushima-Raman Lecturer Award, Chemical Research Society of India, JSPS-DST (2020)

Shimazu Award (2022).

## **PUBLICATIONS**

214 Original Papers (in refereed journals, including accepted papers.)

32 Reviews (including Japanese reviews)

14 Chapters of Book (including Japanese books)

1 Edited Book

## **TEN SELECTED ORIGINAL PAPERS**

1. F. Wei, S. Urashima, S. Nihonyanagi and T. Tahara, "Elucidation of pH-dependent electric double layer structure at the silica/water interface using heterodyne-detected vibrational sum-frequency generation spectroscopy," *J. Am. Chem. Soc.* **145**, 8833-8846 (2023).
2. R. Kusaka, S. Nihonyanagi and T. Tahara, "The photochemical reaction of phenol becomes ultrafast at the air-water interface", *Nat. Chem.* **13**, 306-311 (2021).
3. B. Sarkar, K. Ishii and T. Tahara, "Microsecond folding of preQ<sub>1</sub> riboswitch and its biological significance revealed by two-dimensional fluorescence lifetime correlation spectroscopy", *J. Am. Chem.*

*Soc.* **143**, 7968-7978 (2021).

4. H. Kuramochi, S. Takeuchi, M. Iwamura, K. Nozaki and T. Tahara, "Tracking photoinduced Au-Au bond formation through transient terahertz vibrations by femtosecond time-domain Raman spectroscopy", *J. Am. Chem. Soc.* **141**, 19296-19303 (2019).
5. H. Kuramochi, S. Takeuchi, K. Yonezawa, H. Kamikubo, M. Kataoka and T. Tahara, "Probing the early stages of photoreception in photoactive yellow protein with time-domain Raman spectroscopy", *Nat Chem.* **9**, 660 - 666 (2017).
6. T. Otsu, K. Ishii, and T. Tahara, "Microsecond protein dynamics observed at the single molecule level," *Nat. Commun.* **6**, 7685/1-9 (2015).
7. J. Mondal, S. Nihonyanagi, S. Yamaguchi and T. Tahara, "Three distinct water structures at a zwitterionic lipid/water interface revealed by heterodyne-detected vibrational sum frequency generation," *J. Am. Chem. Soc.* **134**, 8, 7842-7850 (2012).
8. M. Iwamura, H. Watanabe, K. Ishii, S. Takeuchi and T. Tahara, "Coherent nuclear dynamics in ultrafast photoinduced structural change of bis(diimine)copper(I) complex," *J. Am. Chem. Soc.* **133**, 7728-7736, (2011).
9. S. Nihonyanagi, S. Yamaguchi and T. Tahara, "Direct evidence for orientational flip-flop of water molecules at charged interfaces: a heterodyne-detected vibrational sum frequency generation study," *J. Chem. Phys.* **130**, 204704/1-5 (2009).
10. S. Takeuchi, S. Ruhman, T. Tsuneda, M. Chiba, T. Taketsugu and T. Tahara, "Spectroscopic tracking of structural evolution in ultrafast stilbene photoisomerization" *Science*, **322**, 5904, 1073-1077 (2008).

## **FIVE SELECTED REVIEWS**

1. H. Kuramochi and T. Tahara, "Tracking ultrafast structural dynamics by time-domain Raman spectroscopy," *J. Am. Chem. Soc.* **143**, 9699-9717 (2021). (Perspective)
2. S. Nihonyanagi, S. Yamaguchi and T. Tahara, "Ultrafast dynamics at water interfaces studied by vibrational sum-frequency generation spectroscopy," *Chem. Rev.* **117**, 10665-10693 (2017).
3. S. Yamaguchi and T. Tahara, "Development of electronic sum frequency generation spectroscopies and their application to liquid interfaces," *J. Phys. Chem. C*, **119**, 14815-14828 (2015). (Feature Article)
4. M. Iwamura, S. Takeuchi and T. Tahara, "Ultrafast excited-state dynamics of copper (I) complexes," *Acc. Chem. Res.* **48**, 782-791 (2015).
5. S. Nihonyanagi, J. A. Mondal, S. Yamaguchi and T. Tahara, "Structure and dynamics of interfacial water studied by heterodyne-detected vibrational sum-frequency generation," *Ann. Rev. Phys. Chem.* **64**, 579-603 (2013).

## **GRADUATE COURSE TAUGHT**

Advanced Molecular Spectroscopy, Saitama University (2003 - present).

Special Lecture Course, University of Tokyo (2004, 2005, 2006).

Special Lecture Course, Graduate School of Science, University of Kyoto (2004).

Special Lecture Course, Graduate School of Engineering, University of Kyoto (2004).  
Special Lecture Course, Kobe University (2004).  
Special Lecture Course, Nagoya University (2007).  
Special Lecture Course, Tokyo Institute of Technology (2008, 2018).  
Special Lecture, Tokyo Institute of Technology (2010).  
Special Lecture Course, Hiroshima University (2011).  
Special Lecture Course, Kwansei Gakuin University (2012).  
Special Lecture Course, Gakushuin University (2018).  
Special Lecture Course, Hokkaido University (2019)

### **PROFESSIONAL ACTIVITY (International, Selected)**

Editorial Advisory Board, Journal of Physical Chemistry Letters (2020 – present)  
Editorial Board, Journal of Chemical Physics (2013 - 2015).  
Advisory Editorial Board Member, Chemical Physics (2012 - present).  
Editorial Advisory Board, Journal of Physical Chemistry (2010 – 2012).  
Guest Editor, Chemical Physics and Physical Chemistry, Themed Issue on “Complex molecular systems: supramolecules, biomolecules and interfaces” (2017).  
Guest Editor, Chemical Physics, Special Issue on Edwin J. Heilweil (2017).  
Guest Editor, J. Chem. Phys. Special Issue on Time-Resolved Vibrational spectroscopy (2023, expected)  
Guest Editor, J. Phys. Chem., Festschrift for Hiro-o Hamaguchi (2023, expected)

International Advisory Committee, International Conference on Time-Resolved Vibrational Spectroscopy (TRVS) (2008 - present).  
International Steering Committee, International Conference on Raman Spectroscopy (ICORS) (2010 - 2016).  
International Steering Committee, the Asian Spectroscopy Conference (ASC) (2015 - present)

Chair, 16<sup>th</sup> International Conference on Time-Resolved Vibrational Spectroscopy (TRVS XVI) (2013).  
Program Chair, Ultrafast Phenomena (2020).  
General Chair, Ultrafast Phenomena (2022).  
Chair, 8<sup>th</sup> Asian Spectroscopy Conference (ASC2023) (2023).

### **PROFESSIONAL ACTIVITY (Domestic, Selected)**

Head, Division of Advanced Laser Spectroscopy, Spectroscopical Society of Japan (2005 - 2021).  
Advisory Committee, Institute for Molecular Science (2012 - 2016).  
Board, Spectroscopical Society of Japan (2014 - 2018).  
President, Japan Society of Molecular Science (2018 - 2020).

A02 Group Leader, Grant-in-Aid for Scientific Research on Priority Area (KAKENHI project), “Molecular

Science for Supra Functional Systems,” MEXT (2007-2012).

Head, Grant-in-Aid for Scientific Research on Innovative Areas (KAKENHI project), “Soft Molecular Systems,” MEXT (2013-2018).

#### **ADMINISTRATIVE WORK at RIKEN (Selected)**

Member, RIKEN Science Council (2005 - present).

Deputy Chair, RIKEN Science Council (2014 - 2016).

Deputy Chair, Chief Scientists Assembly (2008 - 2009, 2012 - 2013).

Chair, Chief Scientists Assembly (2018 - 2020).

Deputy Chair, RIKEN Science Council (2022).

Chair, RIKEN Science Council (2023 -present).