



## Graduate School of Information Science, University of Hyogo 6<sup>th</sup> International Research Seminar

# FROM QUARKS TO NEUTRON STARS AND BLACK HOLES

Wed. 30 Oct. 2024 (13:00 ~ 14:00) JST

**IN-PERSON/ONLINE SEMINAR**

In modern particle physics, the smallest units of matter are known to be elementary particles called quarks. However, how these quarks combine to form protons and neutrons, and further how these particles form atomic nuclei, remains a mystery. Additionally, numerous neutron stars—giant atomic nuclei with a mass similar to that of the Sun but only about 10 km in radius—have been observed in the universe during the past 50 years. Understanding their internal structure in terms of quarks is one of the significant challenges in particle, nuclear and astrophysics. Recently, the phenomenon of two neutron stars merging to form a black hole and to emit the gravitational wave has been observed. Future gravitational wave detections in higher precisions may provide new insights into the quark structure of neutron stars. This talk will explain the challenges of modern physics in trying to unify micro and macro phenomena, from quarks to neutron stars and black holes, with the speaker's recent research.

**Register here (free)**

<https://shorturl.at/5f7Os>

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## Guest Speaker



**Tetsuo Hatsuda**

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### Brief Resume

1981 Kyoto University, BS Physics  
1986 Kyoto University, D.Sci. Physics  
1986 Natl. Lab. for High-Energy Physics (KEK), Visiting Fellow  
1988 The State University of New York at Stony Brook, PostDoctoral Fellow  
1990 CERN, Research Associate Fellow  
1990 University of Washington, INT Research Assistant Professor  
1992 Department of Physics, Univ. of Washington, Assistant Professor  
1993 University of Tsukuba, Associate Professor in Physics  
1998 Kyoto University, Associate Professor in Physics  
2000 Faculty of Science, The University of Tokyo, Professor  
2012 RIKEN Nishina center for Accelerator-based Science, Chief Scientist  
2013 RIKEN iTHES, Group Director  
2016 RIKEN iTHEMS, Program Director

### Awards and Honors

1997 12th Nishinomiya Yukawa Memorial Prize  
2012 17th Award for Academic Papers on Physics (The Physical Society of Japan)  
2012 23rd Tsukuba Prize  
2012 Nishina Memorial Prize  
2014 Commendation for Science and Technology (MEXT)  
2016 57th Toray Science and Technology Award  
2019 Emeritus Professor, The University of Tokyo  
2024 International Honorary Member of the American Academy of Arts and Sciences

**For more details:**

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