Shinji YUASA

Biography

1991　BSc Physics, Faculty of Science and Technology, Keio University

1993　MSc Physics, Graduate School of Science and Technology, Keio University

1996　PhD Physics, Graduate School of Science and Technology, Keio University

1996　Electrotechnical Laboratory, Research Scientist

2001　National Institute of Advanced Industrial Science and Technology (AIST), Senior Researcher

2004　AIST, Group Leader

2010　AIST, Director of Nano-spintronics Research Center

2015　AIST, Director of Spintronics Research Center

2020　AIST, Director of Research Center for Emerging Computing Technologies

2025　AIST, Senior Principal Researcher

2026　Tohoku University, Graduate School of Engineering, Distinguished Professor

・He has also served in various roles, including an Advisor for the Japan Science and Technology Agency (JST) Core Research for Evolutional Science and Technology (CREST) program since 2020; an Advisor for the JST Fusion Oriented Research for disruptive Science and Technology (FOREST) program since 2023; Vice President of the International Union of Pure and Applied Physics (IUPAP) and Chair of its Commission on Magnetism (C9) since 2025; and Board Member of the Japan Society of Applied Physics (JSAP) since 2026.

Awards

Year	Award
2001	The Magnetics Society of Japan (MSJ) Best Presentation Award
2002	The Magnetics Society of Japan (MSJ) Best paper Awards
2002	The Japan Society of Applied Physics (JSAP) Best Presentation Award
2003	Tsukuba Encouragement Prize
2005	The Young Scientists' Award by the Minister of Education, Culture, Sports, Science and Technology (MEXT) of Japan
2005	Ichimura Science Prize
2005	The Japan Society of Applied Physics (JSAP) Best Paper Award
2005	The Magnetics Society of Japan (MSJ) Best paper Award
2006	Marubun Science Prize
2006	Tokyo Techno Forum 21 Gold Medal
2006	AIST President Prize
2007	IBM Japan Prize
2008	Asahi Award
2008	The Prime Minister Award for Industry-Academia-Government Collaboration
2008	Japan Surface Science Society Best Paper Award
2009	Inoue Harushige Prize
2009	Tsukuba Prize
2010	Japan Society for the Promotion of Science (JSPS) Prize

2013	IEEE Distinguished Lecturer Award
2014	JSAP Fellow
2015	MSJ Achievement Award
2016	Commendation for Science and Technology by MEXT of Japan
2016	The Japan Society of Applied Physics (JSAP) Best Paper Award
2016	AIST Best Paper Prize
2017	The Japan Society of Applied Physics (JSAP) Best Paper Award
2021	IEEE Fellow
2021	The Future Creative Invention Prize
2022	The Honda Frontier Prize
2023	JSAP Outstanding Achievement Award
2025	AIST Best Paper Prize
2025	MSJ Publication Award
2025	Kato Memorial Prize

Overview of Research

In 2004, Dr. Yuasa invented magnetic tunnel junctions (MTJs) based on magnesium oxide (MgO) tunnel barriers that exhibit a giant tunnel magnetoresistance (TMR) effect.

He subsequently developed mass-manufacturing technology for the MgO-based MTJs in collaboration with a manufacturing equipment maker. The MgO-MTJs are now incorporated into virtually all hard disk drives (HDDs), contributing to increased storage capacity and reduced power consumption.

The HDD market is valued at a few tens billion dollars annually, and HDDs serve as the mainstream storage for data centers, underpinning today's IT society.

Furthermore, Dr. Yuasa collaborated with a semiconductor device manufacturer to develop key foundational technologies for STT-MRAM—a high-performance non-volatile memory utilizing perpendicularly-magnetized MgO-MTJs—thereby contributing to the practical implementation of STT-MRAM. High-sensitivity magnetic sensors based on MgO-MTJs are widely used for applications such as position and rotation sensing and are also expected to enable new applications in fields such as bio-magnetic sensing and current measurement for electric vehicles.