

Curriculum Vitae J. Ignacio Cirac

Theory Division
Max Planck Institute of Quantum Optics
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85748 Garching, Germany

J. Ignacio Cirac, born 11 October 1965, is a Spanish theoretical physicist. His field of research is quantum information theory. With his collaborators, he introduced the first proposals of quantum computers, simulators, and re-peaters with atoms, and developed a theory of tensor networks to describe quantum many-body systems.



BIOGRAPHY

Ignacio Cirac graduated in Theoretical Physics at the Complutense University of Madrid (Spain) in 1988, and gained his PhD in 1991 at the same university. Between 1991 and 1996, he was Associate Professor at the University of Castilla-La Mancha (Spain), and spent eighteen months at the University of Colorado (US) working with Peter Zoller. From 1996 until 2001 he was Professor of Theoretical Physics at the University of Innsbruck (Austria). Since 2001 he is a member of the Max Planck Society and director at the Max Planck Institute of Quantum Optics (Garching, Germany). In 2002 he also became honorary professor at the Technical University of Munich.

RESEARCH

As an expert in quantum computation and its applications, the focus of his research is the quantum theory of information. With his colleague Peter Zoller, he has made the first proposals to build quantum computers and quantum simulators using ions, neutral atoms, and other physical systems. He also discovered how cold atoms experiments can be used to solve problems in material science, high-energy physics, and quantum chemistry. He developed several quantum algorithms to solve a variety of problems with quantum computers. In the field of quantum communication, he introduced the concept of quantum repeaters, proposed the first ways of implementing them with atoms and photons, and provided the first security proof for continuous variable quantum cryptography. He has also introduced basic concepts and techniques in quantum information theory and, in particular, in entanglement theory. With several collaborators, he introduced projected entangled-pair states, which are now widely used in classical computational physics. Additionally, he developed a theory of tensor networks, and related the entanglement in a many-body quantum system with the possibility of describing it efficiently.

AWARDS

Ignacio Cirac has been awarded numerous prizes and recognitions for his work on quantum information, many of them with his colleague and close collaborator Peter Zoller. He received the Wolf Prize in Physics in 2013, the Benjamin Franklin Medal in 2010, the BBVA Frontiers of Knowledge Award in 2008, and the Prince of Asturias Award in 2006. Other awards include the National Prize for Young Researchers and the Medal of the Spanish Royal Physical Society in 1991 and 2003, respectively, the Felix Kuschenitz Prize of the Austrian Academy of Sciences in 2001, the Quantum Electronics Prize from the European Science Foundation in 2005, the National "Blas Cabrera" Prize for Physical, Material and Earth Sciences in 2007, the Carl Zeiss Prize in 2009, the 2013 Niels Bohr Medal, the Hamburg prize in Theoretical Physics in 2015, the Max Planck Medal of the German Physical Society in 2018, and the Bell Prize in Physics and the Micius Quantum Prize in 2019. He is an ordinary member of the Spanish Academy of Sciences, the German Academy Leopoldina, the Bavarian Academy of Sciences, the National Academy of Sciences of the United States, and corresponding member of the Austrian. He holds a honorary doctorships from ten universities.

PERSONAL DATA SHEET

PERSONAL DETAILS	Juan Ignacio Cirac, born 11 October 1965 in Manresa (Spain), Spanish citizenship	
EDUCATION	1983–1988	Licenciado (graduate) in Theoretical Physics, Universidad Complutense de Madrid.
	1988–1991	Ph. D. in Physics, Universidad Complutense de Madrid
POSITIONS HELD	1989–1991	Fellow "Formación del Personal Investigador", Departamento de Óptica, Universidad Complutense de Madrid
	1991–1996	"Profesor Titular de Universidad", Departamento de Física Aplicada, Universidad de Castilla-La Mancha.
	1993–1994	Research Associate, Joint Institute for Laboratory Astrophysics, University of Colorado.
	1996–2001	Professor, Institut für Theoretische Physik, Leopold Franzens Universität Innsbruck.
	Since 2001	Director of the Theory Division, Max-Planck-Institut für Quantenoptik, and Member of the Max Planck Society.
	Since 2002	"Honorarprofessor", Technical University of Munich
	2016–2025	Spokesman of the International Max-Planck Research School Quantum Science and Technology
	Since 2019	Co-Spokesman of the Munich Center for Quantum Science and Technology
	2005–2007 2014–2015 2022–2024	Managing Director, Max-Planck-Institut für Quantenoptik
AWARDS	1992	Premio Nacional a Investigadores Noveles, Royal Physical Society of Spain
	2001	Felix Kuschenitz Preis, Austrian Academy of Sciences
	2002	Medal of the Royal Physical Society of Spain
	2005	Quantum Electronics Prize, European Physical Society
	2006	Prince of Asturias Award for Technical and Scientific Research
	2006	6th International Quantum Communication Award
	2007	National "Blas Cabrera" Prize for Physics, Spain
	2009	"Premios de las artes y de la ciencia", Castilla-La Mancha, Spain
	2009	Carl Zeiss Research Award
	2009	BBVA Foundation Frontiers of Knowledge Award
	2010	Benjamin Franklin Medal
	2010	Premi Nacional de Pensament i Cultura Científica, Spain
	2013	Niels Bohr Institute Medal of Honor, Denmark
	2013	Wolf Prize in Physics
	2013	David Ben Gurion Medal, Ben Gurion University of the Negev, Israel
	2015	Hamburg Prize for Theoretical Physics, Germany
	2015	Medal of Honor of the Foundation García Cabrerizo, Madrid
	2017	Gran Gresol Prize of the Gresol Foundation, Spain
	2018	Max Planck Medal of the German Physical Society
	2019	John Stuart Bell Prize
	2019	Quantum Computer Prize of the Micius Foundation
	2021	Falling Walls Breakthrough of the Year 2021 in Physical Sciences
	2023	Prize in the category "Innovation" awarded by "La Vanguardia", Barcelona
	2025	Prix de l'Académie 2024, Royal Academy of Belgium
	2025	Medal for Scientific Excellence of CSIC, Madrid
	2026	IMRS & MCQST Supervision Award
	2026	ICTP-IBM Richard Feynman Prize for Quantum Computing

HONORS

2001	ISI highly cited scientist
Since 2003	Distinguished Guest Professor, Institut de Ciències Fotòniques, Spain
2005	Doctor Honoris Causa, Universidad Castilla-La Mancha
2007	Doctor Honoris Causa, Universitat Politècnica de Catalunya
2009	Distinguished Research Chair at Perimeter Institute, Canada
2009	ISI highly cited scientist
2009	Thomson Reuters Citation Laureate in Physics
2009	Medalla de Honor, Universidad Complutense de Madrid
2011	Gran Cruz de la Orden del Dos de Mayo de la Comunidad de Madrid
2012	Moore Distinguished Scholar at Caltech, USA
2012	Erwin Schrödinger Distinguished Lecture, Vienna
2012	Tsinghua Songjian Turing Lecture, Beijing
2012	Distinguished Lecturer, Technion, Haifa
2013	Princeton Center for Theoretical Science Lecturer, USA
2014	Visiting Miller Professorship, UC Berkeley
2014	Doctor Honoris Causa, Universidad de Zaragoza
2015	World's Most Influential Scientific Minds (Thomson Reuters)
2015	Distinguished Visiting Professor, Institute for Theoretical Physics, CSIC, Spain
2015	Doctor Honoris Causa, Universitat de València
2015	Doctor Honoris Causa, Universitat Politècnica de València
2016	Profesor Distinguido, ICMAT, Madrid
2016	Severo Ochoa Distinguished Visitor, Instituto de Física Teórica, Madrid
2016	Doctor Honoris Causa, Universidad Europea, Madrid
2017	Honorary Ambassador of Brands of Spain, Foro de Marcas Renombradas Españolas (FMRE), Madrid
2018	Distinguished Member of the Royal Physical Society of Spain
2018	Hanna Visiting Professor, Stanford University
2019	Doctor Honoris Causa, Universidad de Buenos Aires
2020	Highly Cited Researcher in the field of Physics (2019, 2018, 2017, 2016, 2015, 2014)
2022	Doctor Honoris Causa, Universidade da Coruña
2024	Doctor Honoris Causa, Universidad de Nebrija
2024	"Alumno ilustre" of the Universidad Complutense de Madrid
2025	Disruptores Innovation Award 2025 of the journal "El Español", Madrid
2025	Member of Honor of the "Colegio Oficial de Físicos" (COFIS) of the Department of Physics at the Universidad Complutense de Madrid
2026	The Oppenheimer Lecture 2026
2026	International Jacques Solvay Chair in Physics
2026	The Abdus Salam Distinguished Lecture Series 2026
2026	Doctor Honoris Causa, Universidad Carlos III de Madrid, Spain

MEMBERSHIPS

since 2002	Fellow of the American Physical Society
Since 2003	Corresponding member of the Austrian Academy of Sciences, Vienna
Since 2007	Member of Honor of the Academy of Sciences, Murcia
Since 2013	Corresponding member of the Real Academia de Ciencias y Artes de Barcelona
Since 2014	Honorary member of the Spanish Optical Society (SEDOPTICA)
Since 2015	Corresponding member of the Real Academia de Ciencias de Zaragoza
Since 2016	Member of the Royal Academy of Exact, Physical and Natural Sciences, Spain
Since 2017	Member of Leopoldina, National Academy of Sciences
Since 2020	Member of the Bavarian Academy of Sciences
Since 2024	Member of the National Academy of Sciences of the United States
Since 2025	Member of the Academia Europaea

OTHER ACTIVITIES

2000 – 2003	Associate Editor, Physical Review A
Since 2001	Founding Managing Editor, Quantum Information and Computation
2002 – 2005	Associate Editor, Revista Española de Física
2005 – 2008	Member of the Kuratorium IQOQI, Austrian Academy of Sciences
2005 – 2008	Member of the International Advisory Board QIP IRC, EPSRC, UK
2005 – 2011	Associate Editor, Review of Modern Physics
2007 – 2010	Member of the Advisory Board ITAMP, Harvard University
2007 – 2020	Member of the Scientific Advisory Board, Centre of Quantum Technology, NUS, Singapore
2007 – 2009	Member of the xQIT Visiting Committee, MIT
2007 – 2008	Member of the CIAR Review Panel, Toronto
Since 2008	Member of the Advisory Board Centro de Ciencias de Benasque
2008 – 2010	Member of Consejo Rector, Consejo Superior de Investigaciones Científicas
2010 – 2020	Member of the Scientific Committee, Fundación BBVA
2011 – 2017	Member of the Review Panel, QSIT, Swiss National Science Foundation
Since 2012	Chair of the Scientific Advisory Board of ICFO
Since 2012	Member of the Scientific Advisory Board of the Condensed Matter Physics Center (IFIMAC) at Universidad Autónoma de Madrid
Since 2012	Member of the Advisory Board of <i>Annalen der Physik</i>
2012 – 2019	Member of the Advisory Board of the Russian Quantum Center
Since 2014	Member of the Member of the International Scientific Committee of the Donostia International Physics Center (DIPC)
Since 2015	Member of the Advisory Board of the Institute for Interdisciplinary Information Sciences, Tsinghua University
2016 – 2020	Member of the Advisory Board of Fundació LA CAIXA
Since 2017	Member of the Editorial Advisory Board of Advanced Quantum Technologies
Since 2020	Member of the Scientific Advisory Board of the Institute of Atomic and Molecular Sciences (IAMS), Academia Sinica
2020	Member of the Scientific Advisory Board of Weizmann Institute
Since 2020	Member of the Scientific Committee of Fundació LA CAIXA
Since 2021	Member of the external advisory board of the NSF Quantum Leap Challenge Institute for Robust Quantum Simulation at the University of Maryland
2021 – 2026	Member of the International Advisory Committee of Kyoto University, for the grant “Extreme Universe” funded by the Ministry of Education
2022	Member of the visiting committee at the Physics Department at École Normale Supérieure (ENS), Paris
Since 2022	Member of the Advisory Board of Telefonica TECH
Since 2025	Member of the Scientific Advisory Board of the Walther Meißner Institute of the Bavarian Academy of Sciences, Garching
Since 2025	Member of the Scientific Advisory Board of Quantum Science Austria
Since 2025	Member of the Advisory Board of the “Collegium Helveticum” at the Eidgenössische Technische Hochschule Zürich (ETHZ)
2026 – 2028	Distinguished Invited Professor (DIP) at ICFO (Spain)