

## Franco Nori

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### Education

1987: Ph.D. in Physics, Univ. of Illinois at Urbana-Champaign, USA.

1983: M.S. in Physics, Univ. of Illinois at Urbana-Champaign, USA.

1982: Licenciado (i.e., B.S.) in Physics, Cum Laude, Univ. Simon Bolivar, Venezuela. Highest GPA among all graduating students at the entire University.

### Professional Positions

- 2013— present: Chief Scientist. Theoretical Quantum Physics Laboratory, Cluster for Pioneering Research.  
Also (during 2013-2017) concurrent positions as: Group Director of the Quantum Condensed Matter Research Group, CEMS, and also Team Leader at iTHES (Interdisciplinary Theoretical Sciences). All at RIKEN, Saitama, Japan.
- 2002— 2012: Team Leader, Frontier Research System and Advanced Science Institute, RIKEN, Saitama, Japan.
- 1990— present: Assistant Professor, Associate Professor, Full Professor and Research Scientist; Dept. of Physics, University of Michigan, Ann Arbor, USA.
- 1987—89: Postdoctoral Research Fellow, Institute for Theoretical Physics, University of California, Santa Barbara.
- 1982—87: Conicit Fellow and Graduate Research Assistant; Physics Department. Also at the Materials Research Laboratory; University of Illinois.

## Selected Distinctions, Awards, and Honors

- **2018: Listed as a “*Highly Cited Researcher*”**, based on the Web of Science data. The only non-Japanese in Japan in the Physics category (11 in total for all of Japan in 2017, and 8 total for 2018). This because, during the last decade, his research group produced **40 highly cited publications (top 1% cited publications among all papers in all areas of physics)**.
- **2017: Listed as a “*Highly Cited Researcher*”**, based on the Web of Science data. The only physicist from the University of Michigan, Ann Arbor, in the Physics category.
- 2017: Elected Member of the Latin American Academy of Sciences.
- 2016: Elected Foreign Member of the Swedish Royal Society of Arts and Sciences, in Gothenburg, Sweden.
- 2014: Elected Fellow of the Optical Society of America (OSA) “for fundamental contributions to quantum information science and optics, including circuit quantum electrodynamics, and the interface between quantum optics and quantum circuits”.
- 2014: Prize for Research in Physics, Matsuo Foundation, Japan. For research on: “Atomic physics and quantum optics using superconducting quantum circuits.”
- 2013: (Sept.) Korea University Distinguished Visiting Professorship.
- 2013: Prize for Science: the Commendation for Science and Technology, by the Minister of Education, Culture, Sports, Science and Technology, Japan.
- 2011: Physics World Magazine Top-5 Breakthrough of the year. Also, named #1 reader’s choice for 2001 in “Nature News”. Prominently featured by the press worldwide.

- 2007: Elected Fellow of the American Association for the Advancement of Science (AAAS), USA.
- 2003: Elected Fellow of the Institute of Physics (IoP), UK.
- 2002: Elected Fellow of the American Physical Society (APS): “for innovative theoretical contributions to the study of vortex dynamics, dynamical instabilities, Josephson junction arrays and quantum interference”.
- 1998: "Excellence in Research Award" from the University of Michigan.
- 1997: "Excellence in Education Award" from the University of Michigan.

**Additional distinctions:**

- 2019-present: Advisory Board Member of the “Center for Quantum Frontiers of Research & Technology” (QFoRT), Taiwan. Also advised Quantum Programs in Korea, EU, and USA.
- 2018 (Publons) Peer Review Award: Top 1% in the Field of Physics. Listed #4 in the world.
- 2018 (Publons) Peer Review Award: Top 1% in the Field “Interdisciplinary”. Listed #20 in the world.  
 “The top 1% of reviewers in each field who performed the most verified pre-publication peer reviews on Publons for the 2018 global Peer Review Awards”.
- 2017: Institute of Physics Outstanding Reviewer Award.
- 2017 and 2016: Selected as a Nature top reviewer in 2016 and 2017 because his “continued involvement in the review process is exceptional”, according to the Editor-in-Chief of Nature and Nature Publications.
- 2016-: Member of the Board of QuSTaR, a non-profit organization dedicated to furthering research in the quantum sciences through open-source tools, and workshops.
- 2016-2019 Visiting Scientist Appointment at the Department of Physics of ETH Zurich. Co-advising graduate students from ETH-Zurich.
- 2016-: Advisory Board Member, npj Quantum Information, Nature Partner Journal.
- 2014-2015-2016: Recognition to peer quality reviewing, from the Optical Society of America.
- 2015: Outstanding Reviewer: Physics Letters A.
- 2014: Elected member of FQXi, the Foundational Questions Institute. Received venture capital funds from a Silicon Valley Foundation to support research visitors in our group.
- 2015: Annals of Physics “Most Valued Reviewers” of 2015.
- 2014: Annals of Physics “Most Valued Reviewers” of 2014.

- 2014—present: only member for the area of “Quantum Physics” of the Editorial Advisory Panel of Nature’s Scientific Reports.
- 2014: Selected as outstanding referee (top 5%) of the New Journal of Physics.
- 2014: EPL Distinguished Referee.
- 2013: EPL Distinguished Referee.
- 2011: Elected as Outstanding Referee of the American Physical Society (APS).
- 2011: (\$5K) Croucher Foundation Advanced Study Institute Lecturer, Hong Kong.
- 2000: US National Academy of Sciences “Frontiers of Science” Symposium (only three speakers from Physics, all under 45 years old).
- 1992: General Electric Junior Faculty Fellow at the University of Michigan.
- 1992: Conicit Fellow at the University of Illinois
- 1982: Highest GPA among all graduating students at the entire University USB (undergraduate school).

**Areas of Active Research:** Interdisciplinary research at the interface between quantum information, photonics, classical optics, quantum optics, atomic physics, mesoscopics, opto-mechanics, condensed matter physics, and nano-science.

**Publications in Refereed Journals.** These are available online here:

<http://dml.riken.jp/pub/>

<http://www.researcherid.com/rid/B-1222-2009>

<https://publons.com/researcher/1298366/franco-nori/>

<http://scholar.google.com/citations?user=SRUYLREAAAJ&hl=en>

**ISI Web of Science (ResearcherID): > 34K citations and h-index 89.**  
**Average citations per article ~ 53**

**Google Scholar: > 48K citations and h-index 102**  
**(since 2014: > 30K citations and h-index 78)**

|       |                |                  |
|-------|----------------|------------------|
| 2013: | ~ 3K citations | (increase ~ 500) |
| 2014: | ~ 3.5K         | ( “ ~ 500)       |
| 2015: | ~ 4K           | ( “ ~ 500)       |
| 2016: | ~ 4.8K         | ( “ ~ 800)       |
| 2017: | ~ 5.7K         | ( “ ~ 900)       |
| 2018: | ~ 7.1K         | ( “ ~ 1400)      |

**Over one hundred publications in *Physical Review Letters*.**

**Over 80 papers with impact factor higher than the one of *Phys. Rev. Lett.***

**More than 50 publications in *Science* and *Nature* journals;**

5 in *Reviews of Modern Physics*; 10 in *Physics Reports*; 3 in *Reports on Progress in Physics*;

Over 300 publications in *Physical Review (A, B, E, X)*, including: over 150 in PRA, over 170 in PRB, over 20 in PRE, 5 in *Phys. Rev. Applied*, and 3 in PRX.

More than 50 publications in *Science* and *Nature* journals (including several in press now); 5 in *Reviews of Modern Physics*; 10 in *Physics Reports*; 3 in *Reports on Progress in Physics*;

Over 20 in *New J. Phys.*, 11 in *Europhysics Letters*. Over 30 in *Physica A/B/C/E*, 5 in *J. Appl. Phys.*, 2 in *Appl. Phys. Lett.* and one in each of the following journals: *Physics Today*, *Scientific American*, *Advances in Physics*, among many others.

In the past decade, his group has published **40 papers ranked in the top 1% cited papers in all areas of Physics**. This is based on the Web of Science data. **Some of these papers are in the top 0.1% and 0.01% most cited papers in all areas of physics.**

Dr. Nori was ranked third in the world (out of a total of 12,269 authors) in the Thompson Reuters Science-Watch census of authors in terms of contributions to quantum computing over the decade 2001-2010 ([sciencewatch.com](http://sciencewatch.com)).

More recent related data from late 2018: Delft Circuits just published these graphs [[Link](#), [PNG\\_1](#), [PNG\\_2](#)] writing: "Plotting almost two decades of superconducting qubit #quantumcomputing research. By PI, date of entering and no. of papers on #arXiv (Q4 2017)". Dr. Nori's group contributions are top in that plot.

During 2010-2014 Nori's 5-year-index is 33, over refereed papers (50 on Google Scholar). These numbers are extremely high for a single author, as can be seen by direct comparison with the total 2010-2014 journal article

output of the major international physics collaborations: BELLE (~400 authors)  $h=19$ ; LIGO (~800 authors)  $h=23$ ; and ATLAS (~3,000 authors)  $h=40$ .

**Invited Talks, Colloquia, Seminars:** Over 300 (invited talks at international conferences; also seminars and colloquia at Universities, and Industrial or National Laboratories).

**Collaborations with industry:** Over the past 18 years, published more than 30 papers in collaboration with industries (NEC, Hitachi, Toshiba, and NTT). Nori also published about 20 papers with researchers from D-Wave (in British Columbia), who joined his group years ago, including some of the founders (A. Zagoskin and A. Smirnov). Also published back-to-back papers with experimentalists from IBM and NEC-Princeton. Nori is now involved with several long-term collaborations with NTT Research Laboratories (on topological physics, and solving computationally hard problems).

**Current research activities include:**

Research in *optics and photonics*: over 60 recent works in this area (including 15 publications listed as Highly Cited, i.e., top 1% in all areas of physics) are listed here:

<https://dml.riken.jp/pub/optics/>

More than 400 papers are listed here: <https://dml.riken.jp/pub/quantum/>

covering our research on:

- *Quantum Nano-Electronics*
- *Quantum Computing*
- *Quantum Information*
- *Microwave Quantum Optics*
- *Circuit Quantum Electrodynamics*
- *Superconducting Qubits*
- *Opto-Mechanics*
- *Hybrid Quantum Circuits*
- *Quantum Simulations*
- *and related topics*

Our research work in *nano-mechanics* is available here:

<https://dml.riken.jp/pub/quantmechanical/>

Over 25 very recent works on *quantum nonlinear optics, and the ultra-strong coupling regime in cavity quantum electrodynamics* are available here:

<https://dml.riken.jp/pub/Ultra-strong/>

Our work on *Landau-Zener-Stückelberg-Majorana interferometry; Adiabatic quantum computing*, etc., is available here:

<https://dml.riken.jp/pub/landau-zener-transitions/>

Publication list: in reverse chronological order, it is available online here:

<https://dml.riken.jp/pub/reverselist/>

A list in chronological order is available here: <http://dml.riken.jp/pub/list/>

Thematic lists, grouping papers by topics, or sub-areas are also available online here: <http://dml.riken.jp/pub/>

[PDF] refers to local copies of papers, stored in a local server and available to all, 24/7. Effectively, all of our papers are Open Access, which is a goal for many funding agencies. [Link] refers to links to the HTML page of the actual journal. [arxiv] provide a hyperlink to the arXiv version.

These two lists (chronological and reverse chronological orders) are long. A much shorter list can be found here: <http://dml.riken.jp/pub/prl/> with over one hundred publications in Physical Review Letters, which aims at publishing top-quality research in Physics, which is also of general interest.

More than 50 publications in Science and Nature journals are available here:

<http://dml.riken.jp/pub/natscipub/>

Summaries of our work, written by top experts in those fields, are available in about 20 “News and Views” (from Nature journals), Science “Perspectives”, and summaries in APS “Physics”. These are available here:

<http://dml.riken.jp/pub/natscirev/>

Those articles feature our works, and provide pedagogical summaries of some of our results, as explained by top experts.

Nori's 40 highly cited papers are listed in: <https://dml.riken.jp/pub/highly-cited>

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Google Scholar maintains separately lists on different subject areas including:

**quantum optics:** (top 5 in that list)

[https://scholar.google.co.jp/citations?view\\_op=search\\_authors&hl=en&mauthors=label:quantum\\_optics](https://scholar.google.co.jp/citations?view_op=search_authors&hl=en&mauthors=label:quantum_optics)

**quantum information:** (top 5, not counting John Bell, who passed away in 1990)

[https://scholar.google.co.jp/citations?view\\_op=search\\_authors&hl=en&mauthors=label:quantum\\_information](https://scholar.google.co.jp/citations?view_op=search_authors&hl=en&mauthors=label:quantum_information)

**circuit QED:** (top 1 in that list)

[https://scholar.google.com/citations?view\\_op=search\\_authors&hl=en&mauthors=label:circuit\\_qed](https://scholar.google.com/citations?view_op=search_authors&hl=en&mauthors=label:circuit_qed)

**superconductivity:** (top 5 in that list, not counting Landau, and a multiple-"Wang" entry there)

[https://scholar.google.co.jp/citations?view\\_op=search\\_authors&hl=en&mauthors=label:superconductivity](https://scholar.google.co.jp/citations?view_op=search_authors&hl=en&mauthors=label:superconductivity)

Our research is top-five ranked in the above publicly available lists (as well as in other lists).

**condensed matter physics:** (top 14 in that list, not counting a deceased entry there. But this is a huge field)

[https://scholar.google.co.jp/citations?view\\_op=search\\_authors&hl=en&mauthors=label:condensed\\_matter\\_physics](https://scholar.google.co.jp/citations?view_op=search_authors&hl=en&mauthors=label:condensed_matter_physics)



All the URLs below provide direct links to separate publications lists (by topic, by journal, etc.). These have direct links to all publications.

## Publications ( <https://dml.riken.jp/pub/> )

### Chronological

- [Reverse Chronological List of Publications](#)
- [Chronological List of Publications](#)

### Research Areas

- [Quantum Information, Quantum Computing, Superconducting Quantum Circuitry](#)
- [Quantum electro-mechanical systems \(e.g., beams, cantilevers\), quantum thermodynamics, and cooling quantum systems](#)
- [Landau-Zener transitions; Landau-Zener- Stückelberg-Majorana interferometry; Adiabatic quantum computing, etc.](#)
- [Ultra-strong coupling regime in cavity quantum electrodynamics](#)
- [Casimir effect](#)
- [Majorana physics](#)
- [Topological physics](#)
- [Polaritons](#)
- [Graphene, quantum dots, Majorana fermions, Weyl semimetals, etc.](#)
- [Leggett-Garg inequalities, Quantum Steering](#)
- [Plasmonics, Surface Waves, Metamaterials, Left-handed Materials](#)
- [Optics](#)
- [Electron Vortex Beams](#)
- [Collective Transport:](#)
  - [Terahertz Radiation](#)
  - [Vortex Dynamics](#)
  - [Controlling the motion of quanta or tiny particles](#)
  - [Granular Materials](#)
  - [Avalanches, Jamming, Stick-Slip Motion, and Highly-Nonlinear Dynamical Instabilities](#)
- [Superconducting Networks, Josephson junction Arrays, Electron Motion in Magnetic Fields, Path-integrals, Quantum Interference](#)
- [Controlling Quantum Noise in Condensed Matter: Squeezed Phonons, quantum control and quantum noise suppression](#)
- [Phonons: Phonon Lasers, Phonon Diodes, Phonon Cavities, Phonon Blockade, Acoustic Interference, and Phonon Localization](#)
- [Biophysics and Biology](#)

- Energy-related research (solar energy, light-to-electricity conversion, photosynthesis, proton pumps, etc.)

#### Reviews

- Short Reviews in Science and Nature journals
- Review Papers

#### Ordered by journals

- Physical Review Letters
- Science and Nature journals
- Publications in other high impact journals

#### Citations

- Google Scholar
- Researcher ID
- Highly Cited Researcher, 2017 [PDF] and 2018 [PDF], according to the Web of Science

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Regarding outreach efforts and explaining science to the general public:

A very incomplete list of news related to our research work is here:

<http://dml.riken.jp/outreach/>

That page has many hyperlinks, where the press has prominently featured our results, for the general public, and also for other scientists.

Nori is a US citizen Hispanic Physicist, and is a lifetime member of SACNAS (the Society for Advancement of Chicanos/Hispanics & Native Americans in Science).

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