

## CHRIS QUIGG · PHYSICIST

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Born 15 December 1944 in Bainbridge, Maryland, USA · United States citizen

### PROFESSIONAL POSITIONS

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Theoretical Physics Department, Fermi National Accelerator Laboratory, 1974–present;  
Distinguished Scientist Emeritus, 2017–present; Department Head, 1977–1987.

Superconducting Super Collider Central Design Group  
Deputy Director for Operations, 1987–1989.

Institute for Theoretical Physics, State University of New York, Stony Brook  
Associate Professor, 1974; Assistant Professor, 1971–4; Research Associate, 1970–1.

### SECONDARY AFFILIATION

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University of Chicago Department of Physics and Enrico Fermi Institute,  
Professor (part-time), 1982–1991; Professorial Lecturer, 1978–1982; Visiting Scholar,  
Enrico Fermi Institute, 1974–1978.

### EDUCATION

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Yale University · B.S., Physics, 1966.  
*Magna cum laude*, with honors with exceptional distinction in physics.

University of California, Berkeley · Ph.D., Physics, 1970; Thesis advisor, J. D. Jackson.  
*Two-Reggeon-Exchange Contributions to Scattering Amplitudes at High Energies.*

### HONORS AND AWARDS

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Phi Beta Kappa, 1966.  
Sigma Xi, 1966.  
De Forest Pioneers Prize (Yale University), 1966.  
Woodrow Wilson Fellowship, 1966–1967.

## HONORS AND AWARDS *continued*

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University of California Science Fellowship, 1967–1970.

Alfred P. Sloan Foundation Research Fellowship, 1974–1978.

Fellow of the American Physical Society, 1983,

for his numerous significant contributions in the theory of elementary particle physics and high energy collisions. His activities span work on multiparticle production, production and decay of intermediate bosons, and signatures of charmed mesons. One of the many notable contributions is the work on Quarkonium states, noted for lucid and seminal nonrelativistic quantum mechanics application.

Scholar-in-Residence, Bellagio Study and Conference Center, 1990.

Fellow of the American Association for the Advancement of Science, 1992,

for distinguished research in high energy physics and theory of the fundamental interactions of the elementary particles.

Alexander von Humboldt Foundation Senior Scientist Award, 2007–2012, 2015–2018.

J. J. Sakurai Prize of the American Physical Society for outstanding achievement in particle

theory, 2011 (with Estia J. Eichten, Ian Hinchliffe, and Kenneth D. Lane),

for their work, separately and collectively, to chart a course for the exploration of TeV scale physics using multi-TeV hadron colliders.

## EDITORIAL POSITIONS

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*Annual Review of Nuclear and Particle Science*

Editor, 1994–2004; Member, Editorial Committee, 1990-3.

*Reviews of Modern Physics*

Associate Editor for high-energy physics, particles, and fields, 1981–1993.

*Physical Review Letters*

Divisional Associate Editor for Particles and Fields, 1980-3.

## PUBLICATIONS & SEMINARS

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Download a hyperlinked list of my publications [here](#), or the INSPIREHEP listing [here](#).

Download a list of seminars and summer school lectures, with recent hyperlinks, [here](#).

## VISITING POSITIONS

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Rutherford High Energy Laboratory: Vacation Consultant, 1971.

National Accelerator Laboratory: Theory Year Visitor, 1972; 1973–1974.

CERN (European Laboratory for Particle Physics), Geneva: Visiting Scientist, 1973, 1975, 1981, 1982, 1994, 1998–2000, 2005–2020.

California Institute of Technology: Visiting Associate, 1974.

Lawrence Berkeley Laboratory: Visiting Scientist, 1978, 1985, 1989–1990.

### VISITING POSITIONS continued

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Laboratoire de Physique Théorique et Hautes Énergies, Université de Paris XI, Orsay: Visiting Professor, 1980.

Laboratoire de Physique Théorique de l'École Normale Supérieure, Paris: Visiting Professor, 1981–1982; ENS Invited Professor, 2015, 2019.

Department of Physics, University of California, Berkeley: Visiting Professor, 1987–1990.

University of Vienna: Erwin Schrödinger Gastprofessur, 1991.

Department of Physics and Laboratory of Nuclear Studies, Cornell University: Visiting Professor, Spring 1995.

Department of Physics, Princeton University: Visiting Professor, Spring 1997.

Institut für Theoretische Teilchenphysik, Universität Karlsruhe: Humboldt Prize Visiting Professor, Spring 2008; Fall 2008; Spring 2009, Spring 2011.

Institut für Theoretische Elementarteilchenphysik and Institute for Advanced Study, Technische Universität München & Arnold Sommerfeld Center for Theoretical Physics, Ludwig-Maximilians-Universität: Humboldt Prize Visiting Professor, Fall 2009, Fall 2010, Fall 2012, Fall 2013, Fall 2015, Fall 2017, Fall 2019.

NIKHEF (Dutch National Institute for Subatomic Physics), Amsterdam: Visiting Scientist, Fall 2011, Spring 2018.

### LECTURESHIPS

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Bernard Gregory Memorial Lectures, Collège de France (Paris), École Polytechnique (Palaiseau), and CERN (Geneva), 1987.

Solomon Kasper Memorial Lecturer, Kenyon College, 1987.

*The Infinite Voyage* Discovery Lecturer, 1987–8.

American Institute of Physics Visiting Scientist Program in Physics, 1987–2001.

American Physical Society Centennial Lecturer, 1998–99.

Moti Lal Rustgi Memorial Lecturer, University at Buffalo, 2002.

Donald M. Hamister Distinguished Lecturer, Kenyon College, 2005.

Emilio Segrè Distinguished Lectures in Physics of the Raymond & Beverly Sackler Foundation, Tel Aviv University: Yossef Dothan Memorial Lecture, 2008.

41st Annual Llewellyn G. Hoxton Lecture for the General Public, University of Virginia Department of Physics, 2013.

Carl Friedrich von Siemens Foundation Lecture, Munich, 2015.

Leon Lederman Memorial Lecture, Illinois Institute of Technology, 2019.

### PROFESSIONAL SOCIETIES

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American Association for the Advancement of Science  
Nominee for Physics Section Chair, 2016.

## PROFESSIONAL SOCIETIES continued

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- American Association of Physics Teachers
  - Investment Advisory Committee, 2013-6.
- American Physical Society
  - Nominee for Presidential line, 2008.
  - Committee on Fellowship, 1998–2000.
  - Publications Oversight Committee, 1998–2001.
  - Program Co-chair, 2001 April Meeting, Washington.
  - Program Chair, 2002 April Meeting, Albuquerque.
  - Chair, Task Force on the April Meeting, 2006.
- Division of Particles and Fields of the American Physical Society
  - Past Chair, 2002; Chair, 2001; Chair-Elect, 2000; Vice Chair, 1999.
  - Executive Committee, 1984-5; Publications Committee, 1973-7;
  - Program Committee, 1976-8; Nominating Committee, 1977.

## BOARDS

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- Superconducting Super Collider Board of Overseers, Universities Research Association, 1984–1987.
- Illinois Mathematics and Science Academy Board of Trustees, 2001–7.
- Forum 21 Advisory Board (Paris), 2002–5.

## EXPERIMENTAL PROGRAM ADVISORY COMMITTEES

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- Stanford Linear Accelerator Center Program Advisory Committee, 1974–1977.
- Fermi National Accelerator Laboratory Physics Advisory Committee (ex-officio), 1975–1987, 1990–1993.
- Brookhaven National Laboratory High Energy Advisory Committee, 1977–1979.
- Superconducting Super Collider Laboratory Program Advisory Committee, 1992–1993.
- CERN / European Laboratory for Particle Physics International Advisory Committee for the Future Circular Colliders Study, 2017–

## GOVERNMENT ADVISORY COMMITTEES

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- U.S. Department of Energy
  - Technical Assessment Committee for University Programs, 1982–3
- U.S. Department of Energy and National Science Foundation
  - High Energy Physics Advisory Panel, 2001–2002.
- Subpanels of the High Energy Physics Advisory Panel
  - Subpanel on Theoretical Computing (Chair), 1984.
  - Subpanel on Computing Needs, 1984–1985.

#### GOVERNMENT ADVISORY COMMITTEES continued

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- Subpanel on Future Modes of Experimentation, 1988.
- Subpanel on Superconducting Super Collider Physics, 1990.
- Natural Sciences and Engineering Research Council of Canada
  - Advisory Committee on Physics and Astronomy, 1984–7;
  - High Energy Physics Grant Selection Committee, 1982–4.

#### NATIONAL ACADEMY OF SCIENCES & NATIONAL RESEARCH COUNCIL PANELS

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- National Academy of Sciences
  - Film Committee for the WQED television series, *The Infinite Voyage*, 1985–7.
- National Research Council
  - Physics Survey Panel on Elementary-Particle Physics, 1983–4.
  - Research Briefing on Scientific Frontiers and the Superconducting Super Collider, 1985.

#### PRIZE SELECTION COMMITTEES

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- J. J. Sakurai Prize Selection Committee of the American Physical Society, 1988, 1995–6.
- E. O. Lawrence Prize Selection Committee of the U.S. Department of Energy, 1988.
- Superconducting Super Collider National Fellowship Selection Committee (Chair), 1990.
- I. I. Rabi Prize Selection Committee of the American Physical Society, 1996.
- John T. Tate Medal for International Leadership in Physics Selection Committee (Chair), American Institute of Physics, 2011.
- Alexander Zaks Scholarship Selection Committee, Tel-Aviv University, 2018–.

#### VISITING COMMITTEES

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- Lawrence Berkeley National Laboratory
  - Physics Division Review Committee, 1978–81; 1997–9.
  - Particle Data Group Review Committee, 1984–7.
- Vanderbilt University
  - External Review Committee, Department of Physics and Astronomy, 1991.
- Brookhaven National Laboratory
  - Department of Energy Review of the High-Energy Physics Program, 1998.
- Stanford Linear Accelerator Center
  - Department of Energy Review, 1998–9.
- Purdue University
  - Department of Physics Review, 2008.
- Tsinghua University (Beijing)
  - High-Energy Physics Center International Advisory Committee, 2008–2014; Chair, 2008–2012.

## VISITING COMMITTEES *continued*

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AÉRES : Agence d'Évaluation de la Recherche et de l'Enseignement Supérieur (France)

Review of Laboratoire de Physique Théorique, Orsay, 2008.

Helmholtz Alliance (Germany)

Review of Elementary Particle Physics Program, 2009.

DISCOVERY Center, University of Copenhagen

International Advisory Committee, 2010–2019

## UNIVERSITY COURSES

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Fall Semester 1971, State University of New York, Stony Brook, Physics 343/503, Mathematical Methods of Physics (senior / first-year graduate).

Spring Semester 1972, State University of New York, Stony Brook, Physics 686.1, Special Topics in Particle Physics: High-Energy Collisions (advanced graduate).

Spring Semester 1973, State University of New York, Stony Brook, Physics 512, Quantum Mechanics II (first-year graduate).

Spring Semester 1974, State University of New York, Stony Brook, Physics 512, Quantum Mechanics II (first-year graduate).

Spring Quarter 1978, University of Chicago, Physics 463, Introduction to Particle Physics (senior / first-year graduate).

Fall Quarter 1979, University of Chicago, Physics 466, Gauge Theories in Particle Physics (graduate).

Spring Quarter 1981, University of Chicago, Physics 498, Models of Elementary Particles (advanced graduate).

Winter 1982, Université de Paris, La Chromodynamique Quantique, deuxième année du troisième cycle (advanced graduate).

Spring Quarter 1983, University of Chicago, Physics 464, Elementary Particles and Gauge Theories II (graduate).

Spring Quarter 1984, University of Chicago, Physics 498, Weak Decays of Hadrons (advanced graduate).

Spring Quarter 1985, University of Chicago, Physics 498, Collider Physics (advanced graduate).

Spring Quarter 1986, University of Chicago, Physics 497, Gauge Theories and Particle Physics (graduate).

Winter Quarter 1991, University of Chicago, Physics 497, Gauge Theories and Particle Physics (graduate).

#### UNIVERSITY COURSES continued

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Spring Semester 1995, Cornell University, Physics 646, Gauge Theories and Particle Physics (graduate).

Spring Semester 1997, Princeton University, Physics 539, Gauge Theories and Particle Physics (graduate).

#### SUMMER SCHOOL LECTURES & SHORT COURSES

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Two-Component Models for Particle Production, Canadian Institute of Particle Physics Summer School, McGill University, Montréal, 1973. Three lectures.

Lectures on Charmed Particles, XIth International School for Young Scientists on High-Energy Physics and Relativistic Nuclear Physics, Gomel, Byelorussia, September, 1977. Five lectures.

Introduction to Gauge Theories of the Strong, Weak, and Electromagnetic Interactions, NATO Advanced Studies Institute on Techniques and Concepts of High Energy Physics, St. Croix, U.S. Virgin Islands, 1980. Six lectures.

Models for Hadrons, École d'Été de Physique Théorique, Les Houches, France, 1981. Ten lectures.

Quarkonium Physics, XXIInd Kraków School of Theoretical Physics, Zakopane, Poland, June 1982. Two lectures.

Quantum Chromodynamics near the Confinement Limit, Fourth South African Summer School, Stellenbosch, January 21–February 1, 1985. Nine lectures.

The Fundamental Particles: Their Properties and Interactions; The Standard Model, Chautauqua Short Course in Elementary Particle Physics, Argonne National Laboratory, April 1985. Two lectures.

Physics at the Superconducting Super Collider, International School of Elementary Particle Physics, Kupari–Dubrovnik, Yugoslavia, October 1985. Five lectures.

Supercollider Physics: a Prospectus, Winter School, Panchgani, India, 25 January–5 February 1986. Six lectures.

Elementary Particle Physics: Discoveries, Insights, and Tools, American Association of Physics Teachers Conference on the Teaching of Modern Physics, Fermilab, April 1986. Two lectures.

Recent Results from Fermilab Experiments, Eighth Nuclear and Particle Physics Summer School, Launceston, Tasmania (Australia), February 1987. Four lectures.

Hadron Colliders Beyond the  $Z^0$ , Fifteenth SLAC Summer Institute on Particle Physics, 1987. Three lectures.

## SUMMER SCHOOL LECTURES & SHORT COURSES *continued*

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La Physique aux supercollisionneurs hadroniques, Cours d'hiver, Centre d'Études Nucléaires de Saclay (France), February 1990. Five lectures.

Hadron Supercolliders: The 1-TeV Scale and Beyond, Workshop / Symposium on TeV Physics, China Center of Advanced Science and Technology, Beijing, June 1990. Three lectures.

Four Memos for the Next Millennium: A Brief Future of Particle Physics, LAFEX International School of High Energy Physics, Rio de Janeiro (Brazil), February 1995. Four lectures.

Hadron Collider Physics, Top, and Higgs, Advanced School on Electroweak Theory, Maó, Menorca (Spain), June 1996. Four lectures.

Particle Physics: the Standard Model, Lectures for Summer Students, CERN, Geneva (Switzerland), July 1998. Seven lectures.

Electroweak Symmetry Breaking and the Higgs Sector, XXVII International Meeting on Fundamental Physics, Sierra Nevada (Granada), Spain, 1-5 February 1999. Three lectures.

Particle Physics: the Standard Model, Lectures for Summer Students, CERN, Geneva (Switzerland), July 1999. Eight lectures.

Physics of the Higgs Sector, Asian Winter School in Particle Physics, Korea Institute for Advanced Study, Seoul, February 2000. Five lectures.

The Electroweak Theory, Theoretical Advanced Study Institute, Boulder, June 2000. Four lectures.

Particle Physics: the Standard Model, Lectures for Summer Students, CERN, Geneva (Switzerland), July 2000. Eight lectures.

The Futures of Particle Physics, Frontiers of Contemporary Physics, Vanderbilt University, March 2001. Two lectures

The Standard Model: Electroweak Theory, European School of High-Energy Physics, Pylos (Greece), August 2002. Six lectures.

Beyond the Standard Model, Latin-American School of High-Energy Physics, San Miguel Regla (Mexico), June 2003. Four lectures.

Nature's Greatest Puzzles, SLAC Summer Institute, August 2004. Opening lecture.

Hadron Collider Physics: Measurement, Search, and Discovery at the High-Energy Frontier, XXXIII International Meeting On Fundamental Physics, Benasque (High Pyrenees), Aragon, Spain, March 2005. Three lectures.

Standard Model and Higgs Physics, Summer School on Particle Physics, Abdus Salam International Center for Theoretical Physics, Trieste, June 2005. Five lectures.

## SUMMER SCHOOL LECTURES & SHORT COURSES *continued*

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The Electroweak Theory and Higgs Physics, Fermilab Academic Lectures, November 2005. Six lectures.

Electroweak Symmetry Breaking and the Higgs Sector, LISHEP 2006 – International School on High Energy Physics, Rio de Janeiro, Brazil, March 2006. Three lectures.

Electroweak Theory, Higgs Physics, & Beyond, LNF Spring School, Physics in the LHC Era, Frascati, May 2006. Two lectures.

The Standard Model, Autumn School on High-Energy Physics, Maria-Laach, Germany, September 2006. Four lectures.

The Electroweak Theory: Issues for the LHC Era, Insitute for Theoretical Particle Physics, University of Karlsruhe, September 2005. Four lectures.

Electroweak Theory, the Higgs Sector, and Beyond, China Center for Advanced Science & Technology Workshop on TeV Physics and the Large Hadron Collider, Beijing, November 2006. Four lectures.

Neutrinos in the Electroweak Theory, Summer School on Neutrino Physics, Fermilab, July 2007. Three lectures.

Physics Requirements for the ILC, Opening Lecture, Toward the ILC (School), Fermilab, July 2007.

Cosmic Neutrinos, SLAC Summer Institute, August 2007.

The Electroweak Theory and Higgs Physics, International Summer School and Conference on High Energy Physics: The Standard Model and Beyond, Akyaka, Muğla -Turkey, September 2007. Four lectures.

Introduction to the Standard Model of Particle Physics, Summer School on Theoretical High-Energy Physics and Cosmology, Paphos, Cyprus, July 2008. Five lectures.

Mass, Electroweak Symmetry Breaking, and Physics at the Fermi Scale, Deutsche Physikalische Gesellschaft School, Foundations of Quantum Physics, Bad Honnef, Germany, September 2008. Two lectures.

Potential discoveries at the LHC, Cours d'automne du Laboratoire de l'Accélérateur Linéaire, Orsay, France, November 2009. Four lectures.

Potential discoveries at the LHC, 23rd Taiwan Spring School in Particle Physics, Tainan, March–April 2010. Four lectures.

Potential Discoveries at the Large Hadron Collider, XVI Escola de Verão Jorge André Swieca de Partículas e Campos, Campos do Jordão, February 2011. Five lectures.

The Standard Model of Particle Physics and Its Problems, Spring School on the Philosophy of Particle Physics, Maria in der Aue, Germany, March 2011. Three Lectures.

#### SUMMER SCHOOL LECTURES & SHORT COURSES *continued*

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Potential Discoveries at the Large Hadron Collider, Nordic Conference on Particle Physics, Skeikampen, Norway (Spatind 2012), January 2012. Three lectures.

Particle Physics in the LHC Era, ICTP South American Institute for Fundamental Research School, “The Standard Model—Its Magic and Its Shortcomings,” April 2013. Five lectures.

Invisibles School, University of Durham, “Physics of the Large Hadron Collider,” July 2013. Two lectures.

TASI 2014: Journeys through the Precision Frontier: Amplitudes for Colliders, “The Standard Model of Particle Physics,” June 2014. Three lectures.

Winter School of the Gleb Wataghin Physics Institute, University of Campinas, Brazil, July 2014, “Introduction to Particle Physics.” Five lectures.

Joint CERN–Fermilab Hadron Collider Physics School, Fermilab, August 2014, “The Standard Model of Particle Physics.” Four lectures.

École Normale Supérieure and Laboratoire de Physique Nucléaire et Hautes Énergies, Jussieu, Paris, May 2015, “Large Hadron Collider Physics: The Next Generation,” Three lectures.

#### ORGANIZATION OF CONFERENCES & SCHOOLS

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Organizing Committee, Third International Conference on High-Energy Collisions, Stony Brook, 1973 (Chair).

National Advisory Committee for the XXth International Conference on High Energy Physics, Madison, Wisconsin, 1980.

International Advisory Committee for the NATO Advanced Studies Institute on Techniques and Concepts of High Energy Physics (St. Croix School), 1979–present.

Scientific Advisory Committee, 1983 International Symposium on Lepton and Photon Interactions at High Energies, Ithaca, New York.

Steering Committee, Physics at the Superconducting Super Collider Discussion Group (PSSC), 1983–1984.

National Advisory Committee for the XXIII International Conference on High Energy Physics, Berkeley, California, 1986.

Organizing Committee, First National Symposium on Frontiers of Science, 1988–1989.

International Organizing Committee, European Committee on Future Accelerators Workshop on the Large Hadron Collider, Aachen, 1990.

International Advisory Committee, 1993 International Symposium on Lepton and Photon Interactions at High Energies, Ithaca, New York.

## ORGANIZATION OF CONFERENCES & SCHOOLS *continued*

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Programme Committee, XXVIIth International Conference on High Energy Physics, Glasgow, 1994.

International Advisory Committee, Workshop on the Future of High-Sensitivity Charm Experiments (CHARM2000), Fermilab, June 1994.

International Advisory Committee, International Symposium on Vector Boson Self-interactions, UCLA, February 2–4, 1995.

Program Committee, II Rencontres du Vietnam, Ho Chi Minh City, October 1995.

International Program Committee, XXVIIIth International Conference on High Energy Physics, Warsaw, 1996.

Scientific Advisory Committee, Workshop on Hadron Collider Physics XII, Stony Brook, June 1997.

Advisory Committee, 4th International Conference on Physics Potential & Development of  $\mu^+\mu^-$  Colliders, San Francisco, December 10-12, 1997.

Organizer of the *thinkshop* on top-quark physics for Run 2 of the Tevatron, Fermilab, October 16 - 18, 1998.

International Advisory Committee, LCWS 99, the International Workshop on Linear Colliders, Sitges, Barcelona, Spain, April 28 - May 5, 1999.

Scientific Program Committee, NuFact '99, the ECFA / ICFA Workshop on a Neutrino Factory, Lyon, July 6 - 9, 1999.

Advisory Committee, 5th International Conference on Physics Potential & Development of  $\mu^+\mu^-$  Colliders, San Francisco, December 15-17, 1999.

Advisory Committee, IVth International Conference on Hyperons, Charm and Beauty Hadrons, Valencia, Spain, June 27-30, 2000.

Organizer of the *thinkshop2* on top-quark physics for Run 2 of the Tevatron, Fermilab, November 10–12, 2000.

Program Co-Chair, Washington (April) Meeting of the American Physical Society, 2001.

Organizing Committee, Snowmass Summer Study on the Future of Particle Physics, 2001 (co-chair).

Organizing Committee, Enrico Fermi Centennial Symposium, Fermilab, September 28, 2001.

Program Chair, Albuquerque (April) Meeting of the American Physical Society, 2002.

Program Committee, Fermilab Science: The Witherell Years, Fermilab, July 14, 2005.

Organizing Committee, World Year of Physics Symposium Fermilab, October 8, 2005.

Organizing Committee, Top Turns Ten, Fermilab, October 21, 2005 (chair).

## ORGANIZATION OF CONFERENCES & SCHOOLS *continued*

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International Advisory Committee, Fermilab/CERN Hadron Collider Physics School, 2005–2006.

Organizing Committee, Fermilab Symposia on the Nature of Science, 2006–2009.

Convenor, Project X Physics Study, Fermilab, 2012.

Convenor, The Future of High Energy Physics, Workshop and Symposium, Hong Kong University of Science and Technology, 2015.

## DISSERTATIONS SUPERVISED

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Deepinder P. Sidhu, *Phenomenology of Some Two-Body Reactions at High Energies*, State University of New York, Stony Brook, 1973.

Alexander Wu Chao, *The Geometric Picture in High Energy Collisions*, State University of New York, Stony Brook, 1974.

Choy-Heng Lai, *Charm Contribution to Neutrino Induced Production of Opposite-Sign Dimuons*, University of Chicago, 1978.

David Hochberg, *Finite Volume Effects of Spectrum Calculations: Monte Carlo Study of an Exactly Soluble Field Theory*, University of Chicago, 1984.

Updated June 28, 2020