

June, 2009

**PROFESSIONAL RESUME**

***Prof. Swapan Chattopadhyay, Ph.D. (Berkeley)***  
***F.Inst.P, Fellow APS and AAAS***

*Scientist, Educator, Scientific Leader*

“Quarry Mount”, Top Road, Five Crosses, Frodsham, Cheshire WA6 6SP, United Kingdom

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and

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**BIRTH:** December 26, 1951; Calcutta, India  
**CIVIL STATUS:** Married; two daughters  
**CITIZENSHIP:** U. S. (naturalized as Swapan Chaterji)

**PRESENT POSITION:**

Sir John Cockcroft Professor of Physics  
Universities of Liverpool, Manchester and Lancaster  
United Kingdom

And

**DIRECTOR**

The Cockcroft Institute of Accelerator Science and Technology  
Daresbury Science and Innovation Campus  
Keckwick Lane, Daresbury, Warrington, WA4 4AD,  
Cheshire, United Kingdom  
[swapan@cockcroft.ac.uk](mailto:swapan@cockcroft.ac.uk), tele: +44 (0) 1925 603242, <http://www.cockcroft.ac.uk>

**Other Affiliations :**

Distinguished University Professor, Lancaster University, UK, 2007 – present.  
Associate of Harvard University Physics Department, USA, 2007-present.  
Distinguished Affiliate, John Adams Institute, University of Oxford, 2007-present.  
Visiting Professor, Department of Physics, University of Virginia at Charlottesville, USA, 2003-present.  
Visiting Professor, Naval Post Graduate School, Monterey, California, 2007-present.  
Distinguished Adjunct Professor, Institute of Astro-Particle Physics, Saha Institute of Nuclear Physics, Kolkata, India, 2008-present.  
Visiting Scholar, University of California at Berkeley, 2009-present.  
Scientific Associate (Honorary Attaché ), CERN, 2009-present.  
Fellow, CP-STIO (Collaborative Program – Scientists and Technologists of Indian Origin), India, 2007-present.  
Mentor, Queens University Belfast, Northern Ireland (LIBRA project), 2008-present.

## EDUCATION:

B.Sc.	St. Xavier's College Calcutta University, Calcutta, India.	1970	Honors in Physics (Minors in Mathematics and Chemistry)
M.Sc.	Indian Institute of Technology Kharagpur, India.	1972	Physics (Special Studies in Particle Physics)
M.S.	University of California at Berkeley Berkeley, California USA	1980	Physics
Ph.D.	University of California at Berkeley Berkeley, California USA	1982	Physics

Doctoral dissertation in theoretical physics. *Thesis Title*: "On Stochastic Cooling of Bunched Beams from Fluctuation and Kinetic Theory". *Thesis Advisors*: Prof. Joseph Bisognano, Prof. Owen Chamberlain, and Prof. Wulf Kunkel.

## PROFESSIONAL EXPERIENCE:

**1972-1974**: Teaching and Research Assistant, Dept. of Physics and Institute of Theoretical Physics, Univ. of Oregon, Eugene, Oregon, USA, under the tutelage of Prof. Michael Moravscik and Prof. Rudolph Hwa

**1974-1976**: Teaching and Research Assistant, Dept. of Physics, Univ. of California at Berkeley, California, USA, under the tutelage of Prof. Fredrick Reif and Prof. Geoffrey Chew

**1976-1982**: Graduate Student Research Assistant, Lawrence Berkeley Laboratory and Dept. of Physics, Univ. of California at Berkeley, California, USA, under the tutelage of Prof. Joseph Bisognano, Prof. Owen Chamberlain and Prof. Wulf Kunkel

**1982-1984**: Scientific Associate (Attaché Scientific) at CERN, Geneva, Switzerland, collaborating with Dr. Daniel Boussard, Dr. Simon van der Meer and Prof. Carlo Rubbia

**1984-1985**: Staff Scientist II/Physicist, Lawrence Berkeley Laboratory, Univ. of California, Berkeley, California (member of the Exploratory Studies Group headed by Dr. Max Cornacchia)

**1985-1986**: Staff Scientist III/Physicist, Lawrence Berkeley Laboratory, Univ. of California, Berkeley, California

**1987 - 1991**: Group Leader, Exploratory Studies Group, Accelerator and Fusion Research Division, Lawrence Berkeley Laboratory, Univ. of California, Berkeley, California

**1992-2001**: Founder/Director, Center for Beam Physics and Senior Scientist/Physicist, Lawrence Berkeley Laboratory, Univ. of California, Berkeley, California

**1999-2001**: Divisional Deputy for Strategy, New Initiatives and Program Development, General Sciences Directorate, Lawrence Berkeley National Laboratory, Univ. of California, Berkeley, California

**1987**: Visiting Professor, UC Berkeley

**1991**: Visiting Professor, University of Illinois at Urbana-Champaign

**1995**: Japan Atomic Energy Research Institute (JAERI) Distinguished Visiting Scientist

**1998-2001**: Visiting Professor, Department of Physics, University of California at Berkeley

**2001-2007**: Associate Director (Accelerator Division), Special Scientist, and Executive Member of Director's Council, Thomas Jefferson National Accelerator Facility

**2003-present**: Visiting Professor of Physics, University of Virginia at Charlottesville

**2002-2007**: Chair, JLab Research Operations Committee, Thomas Jefferson National Accelerator Facility

**2002-2007**: Chair, Director's Strategic Planning Working Group, Thomas Jefferson National Accelerator Facility

**2001-2005**: Governor's Advisory Committee on the Virginia Biotechnology Initiative, Commonwealth of Virginia

**2007-present**: Inaugural Director, Cockcroft Institute, UK and Sir John Cockcroft Professor of Physics, Universities of Liverpool, Manchester and Lancaster, United Kingdom

**2007-present**: Member (ex-officio), Governing Board of the Cockcroft Institute; Chair, Cockcroft Institute Management Committee; Member (ex-officio), Cockcroft Institute Industrial Advisory Committee

**2007**: Vice-Chair, Division of Physics of Beams, American Physical Society

**2008**: Chair-Elect, Division of Physics of Beams, American Physical Society

2009: Chair, Division of Physics of Beams, American Physical Society

### **MANAGERIAL EXPERIENCE:**

- 1987-1992: Group Leader for the Exploratory Studies Group, LBL and chief physicist supervising the accelerator physics team for the Advanced Light Source. Led a group of 14 Ph.D. scientists in: (i) the conception, design, construction, commissioning and operation of the Advanced Light Source; (ii) novel FEL studies; (iii) the Superconducting Super Collider (SSC) design; and (iv) the California B-factory initiative.
- 1988-1992: Led a California Coalition involving LBNL, SLAC, LLNL, Caltech, Indiana University, various University of California campuses (Berkeley, San Diego, Santa Cruz, Los Angeles, Santa Barbara, Davis) and Stanford University towards the first Scientific and Technical Conception and Feasibility Study of an asymmetric energy high luminosity B-factory at PEP.
- 1992-2001: Founder and Director, Center for Beam Physics. Scientific direction, leadership and administrative management of a multi-disciplinary research program involving 50 Ph.D. scientists, engineers, technical/administrative personnel, students, visitors and four state-of-the-art scientific laboratories where the technologies of lasers, plasmas, microwaves and particle beams converge on forefront scientific research programs. Founded the I'OASIS laboratory for laser-plasma investigations.
- 1999-2001: Divisional Deputy in the LBNL General Sciences Directorate overseeing Strategy, New Initiatives and Program Development in accelerator-based facilities.
- 2001-2007: Associate Director, Thomas Jefferson National Accelerator Facility. Scientific direction, leadership, administrative and fiscal management of a multidisciplinary research, development, and facilities operations program involving an annual budget of \$60M and a staff of 400 scientists, engineers, technical/administrative personnel, students, visitors, and state of the art laboratories (where lasers, microwaves, particle beams, plasmas, and superconductivity converge on forefront scientific research programs) and two major accelerators: Continuous Electron Beam Accelerator Facility (CEBAF) and the Jefferson Lab Free Electron Laser (FEL).
- 2007-present: Director, Cockcroft Institute, UK. Scientific direction, leadership, administrative and fiscal management and integration of a multidisciplinary research, development, facilities operations, knowledge exchange and technology transfer program establishing an international model of integration of academia, national laboratories and industry under one organization (with a staff of 120 FTEs of scientists, engineers, technical/administrative personnel, post-docs, visitors, students and distinguished visiting affiliates, four state-of-the-art Vacuum, Radio-frequency, Microwave Superconductivity and Advanced Laser Laboratories and an operating electron-beam accelerator facility, ALICE). Responsible for national deliverables to international accelerator projects, education and training of next-generation scientists and engineers, advancing the frontier of accelerator science and technology and creation of knowledge-based economic wealth for the community.

### **TEACHING EXPERIENCE:**

- 1972-1974: Teaching Assistant at Department of Physics, University of Oregon, Eugene, Oregon.
- 1974-1976: Teaching Assistant for Physics 5 and 6 series (for scientists, engineers, premedical students and general training) in the Dept. of Physics at Univ. of California at Berkeley, including laboratory teaching.
- 1976-1977: Reader of graduate courses Physics 205 (Analytical Dynamics) and Physics 227 (Particle and Field

Theory) in the Dept. of Physics at Univ. of California at Berkeley.

- 1978-1980: Expositor and demonstrator of scientific concepts and experiments at the Lawrence Hall of Science, Univ. of California at Berkeley.
- 1987-1988: Taught a formal graduate course at the highest level in physics (Physics 250) titled "Accelerator Physics," in the Dept. of Physics, Univ. of California at Berkeley in the Fall semester of the academic year 1987-1988 (August-December, 1987).
- 1991: Taught a formal graduate course titled "Introduction to Accelerator Physics" in the Dept. of Physics at University of Illinois at Urbana-Champaign as part of the US Particle Accelerator School (June 1 - June 15, 1991).
- 1998-1999: Physics 211 and 212: Statistical Physics - graduate level. Equilibrium and Nonequilibrium (Classical and Quantum) Statistical Physics. Fall 1997 and Spring 1998, UC Berkeley, Physics Department.
- 1998-1999: Michigan State University sponsored web-based lectures for the VU Beam class in 1998 and 1999.
- 1999: Invited lecturer at the Autumn College in Plasma Physics organized by the Abdus Salam ICTP in Trieste, Italy, October and November 1999.
- 1999-2000: Physics 290E: Collider Physics – graduate level, jointly with UC Berkeley Physics Department and LBNL.
- 2001-2002: Initiated Jefferson Lab seminars in CASA (Center for Advanced Studies of Accelerators) and ISRFST (Institute of Superconducting Radio Frequency Science and Technology) and Academic and Professional Training Courses.
- 2004 - 2006: Graduate course in Accelerator Physics, Department of Physics, University of Virginia at Charlottesville.
- 2009: Cockcroft Institute Accelerator Physics Course, “Acceleration, Radiation and Phase Space Cooling”: open to Univ. of Liverpool, Manchester and Lancaster for credit and web-cast internationally.

## **RESEARCH SUPERVISION/MENTORSHIP:**

### *Students: Graduate and Undergraduate*

- Ken Lamon, Ph.D, UC Berkeley – 1993-1996, “Isochronous Ring FEL”
- David Friedberg, 1998 – 2000, CSEE Fellow Student Scholar and US/DOE Energy Research Undergraduate Laboratory Fellow: educational web-page “World of Beams”
- Lauren Ostrofsky, 1998, CSEE Fellow Student Scholar and US/DOE Energy Research Undergraduate Laboratory Fellow: educational web-page “World of Beams”
- Kang-Zhu Guo, 1996 – 1999, Ph.D., student, Peking University, “Laser-plasma Physics”
- Nok Tsao, UC Berkeley, Physics, 2000, “THz R&D”
- Mei Phing, UC Berkeley, Physics, 2000, “Particle Dynamics in Laser Fields”
- Baiju Bhatt, Commonwealth of Virginia Governor’s School student and mentee, 2001-2002, “Synchrotron light from charged particles”-Virginia Junior Science Academy and Caltech Signature awardee
- Ehman Ahmed, Old Dominion University, 2005, “FORT-Far Optical Resonance Trapping at JLab FEL”
- Gambhir Ranjit, Old Dominion University, 2005, “Higher Harmonic Generation via FELs”
- Deepa Angal-Kalinin, Univ. of Liverpool, 2008- present, “Novel Coherent Light Sources”

### *Post Doctoral and Visiting Scientists*

Dr. Graeme Burt, 2007-2008, Mentee and Post-doctoral scientist, Lancaster University, UK.  
Ms. Gui Mei, 2005-2007, Mentee and Visiting Reseracher/Ph.D.student, Peking University/JLab.  
Dr. Stefan Simrock, 2003-2004, Visiting Scientist, DESY, Germany  
Dr. Jacek Sekutowicz, 2001-2004, Visiting Scientist, DESY, Germany  
Dr. Subal Kar, 1999 – 2000, Visiting Fulbright Scholar, India  
Professor Toshiki Tajima, 1998, Visiting Researcher, UT Austin  
Dr. Etienne Forest, 1998, Visiting Researcher, KEK, Japan  
Ms. Shakti Kosta, 1998 – 1999, Visiting Researcher/Ph.D. student, India  
Dr. Ranjan Ray, 1998 – 1999, Visiting Fulbright Scholar, India  
Dr. Martin Berz, 1988 – 1992, post-doctoral scientist  
Dr. Werner Joho, 1991 – 1992, Visiting Scientist from Paul Scherer Institute, Switzerland  
Dr. Malika Meddahi 1991 – 1994, post-doctoral scientist  
Dr. Roland Savoy, 1988 – 1989, post-doctoral scientist  
Dr. Ming Xie, 1988 – 1990, post-doctoral scientist  
Dr. Johan Bengtsson, 1989 – 1990, post-doctoral scientist  
Dr. Jeffrey Tennyson, 1989 – 1990, visiting scientist from UC Berkeley  
Dr. David Robin, 1992, post-doctoral scientist  
Dr. John Edighoffer, 1992 – 1993, visiting scientist from IBM  
Dr. Manoel Conde, 1992 – 1994, post-doctoral scientist  
Dr. Wim Leemans, 1992 – 1994, post-doctoral scientist  
Dr. Dominique Gardent, 1993 – 1994, post-doctoral scientist

### **RESEARCH COLLABORATIONS:**

#### *Scientific Member of:*

1. UK-USA Collaborative AMO Experiment at LCLS, SLAC, Stanford University, 2010-2011.
2. GlueX Experiment in the proposed Hall D of CEBAF 12 GeV Upgrade at Jefferson Lab.
3.  $G^0$ -experiment in Hall C at CEBAF in JLab.
4. Proposed QWEAK experiment in Hall C at CEBAF in JLab.
5. CEBAF Energy Recovery experiment.
6. LHeC Collaboration.

### **COMMITTEES, etc:**

Consultant, Sincrotrone Trieste (President: Carlo Rubbia), 1987.

DOE Technical Review Committees: Argonne National Laboratory's High Energy Physics (HEP) Program, 1990; HEP review of Brookhaven National Laboratory's Accelerator Test Facility (ATF), 1991; HEP review of UCLA Plasma Beat-wave Accelerator Program, 1991.

Director's Technical Review Committee: Fermilab Main Injector Upgrade, 1989.

Director's Technical Advisory Committee for PEP-II B-factory: SLAC, 1992-1996.

Director's Technical Review Committee: SLAC Next Linear Collider, 1996, 1998.

International Study Group (ISG) on Linear Colliders: 1992-present.

Director's Panel to Explore New Directions (PEND): LBL, 1987-'89.

Director's Committee on Laboratory Organization and Staff Reclassification: LBL, 1991.

Director's Task Force on Core Competencies: LBL, 1992.

Divisional Staff Committee: LBNL Accelerator and Fusion Research Division, 1996-present.

Program Committee, US Particle Accelerator Conference: 1989, '93, '95, '97.

Organizing Committee, US Particle Accelerator Conference: 1999, 2001, 2003, and 2005.

International Advisory Board/Program Committee, International Linac Conference: 1990, '92, '94, '96.

International Advisory Committee: European Particle Accelerator Conference, 1996, '98, '00;  
Computational Accelerator Physics Symposium, Darmstadt, Germany, 2000, University of Michigan, East Lansing 2002. Program Committee: ICFA Advanced Accelerator Workshop, BNL, 1992; Fifth Joint US-CERN Particle Accelerator School held in Benalmadena, Spain, 1992; APS Spring Meeting, 1992, 1997, 2000.

ICFA/LBNL Spokesperson: 1986-1998.

LEADER and CO-CHAIR, Group 1, "Non-Conventional Colliders and Luminosity Paradigm", AAC'98, July 5-10, 1998, Baltimore, Maryland.

Program Committee on New Directions in Laser-Beam Interactions, held in Tokyo Metropolitan University, Summer, 1999.

Conference Chairs: Advanced Accelerator Concepts, Granlibakken, Lake Tahoe, 1996; International Neutrino Factory Workshop, NuFact'00, Monterey, CA. 2000.

Organizing Committee: ICFA Workshops in Arcidosso, Italy on Nonlinear Dynamics, Beam Physics and FELs, 1994, 1996, 1998, 2000.

Snowmass '96 – Chair, Advanced Concepts Division.

Member, LBNL Diversity Committee, 1998 – present.

Member, LBNL Awards Committee, 1998 – present.

Chair, Working Group on General Sciences Diversity Plan, 2000.

Reviewer of UC-system wide Proposals for Research based on LLNL Laser Systems, 1997.

Reviewer of Proposals from the Third World Academy of Sciences, 1995, 1998.

Member: APS/DPB Executive Committee, 1997 – 2000.

Chair: APS/DPB Education Committee, 2000.

Chair: APS/DPB Fellowship Committee, 2002-2003.

Advisory and Program Committee: Advanced Accelerator Concepts Workshop, 1994, 1996, 1998, 2000;  
Quantum Aspects of Beam Physics (QABP'99 and '00) Workshops, Monterey, California, 1999 and Capri, Italy, 2000.

Director's Advisory Committee on Run-II Luminosity Program, Fermi National Accelerator Laboratory, 2002.

Director's Advisory Committee on the National Synchrotron Light Sources (NSLS), Brookhaven National

Laboratory (BNL) 2002-2003.

USPAS Accelerator Physics Prize Committee 2002-2003.

Technical Representative to the Department of Energy's BESAC Special Review Panel on the 20 Year Facilities Plan, 2003.

Member: Governor's Advisory Committee on the Virginia Biotechnology Initiative, Commonwealth of Virginia, 2003, 2004.

Scientific Reviewer, Variable Energy Cyclotron Center and Radioactive Ion Beam Facility, Kolkata, India, 2004-.

Chair: Scientific Program Committee, 2005 Particle Accelerator Conference.

Member: Scientific Program Committee, 2006 European Particle Accelerator Conference

Member: Scientific Program Committee, 2007 Asian particle Accelerator Conference

Member: International Advisory Committee, IPAC (International Particle Accelerator Conference), 2010-onwards;

Founding Member: Indo-US Collaboration on Accelerator Science and Technology, 2006 - present

Member: TESLA Technology Collaboration Board, 2005-2007

Member: 2005 – 2007; Accelerator Test Facility (ATF) Program Advisory Committee, Brookhaven National Laboratory

Member: 2005 – present; Acceleratory Advisory Committee (AAC), Fermi National Accelerator Laboratory

Member: 2008-present; DESY Scientific Council (SC) and External Scientific Council (ESC)

Member: 2005 – 2007; Accelerator Science Technical Advisory Board (ASTAB) of CCLRC, UK

Vice-Chair, Chair- Elect and Chair, American Physical Society/Division of Physics of Beams, 2007-2009

## MAJOR ACCOMPLISHMENTS:

- Major contributions during 1982 – 1984, as a member of the group implementing **Stochastic Phase-space Cooling** in the colliding ring complex at CERN, Geneva, Switzerland where the W and Z Bosons were discovered during this period
- Conceptual, theoretical, experimental and technological development of **“Bunched Beam Stochastic Cooling”** of protons, anti-protons and ions during 1978 till 1985, initial one-channel application at the SPS, and final validation in the recent implementation at the RHIC collider at the Brookhaven National laboratory (BNL);
- Led and supervised the team of accelerator physicists that conceived, designed and commissioned the **Advanced Light Source (ALS)** storage ring synchrotron radiation source at Berkeley Lab, 1987-1992
- Laid the accelerator physics foundation and established the technical feasibility of the **Asymmetric Energy Electron-Positron Collider (PEP-II)** for CP violation studies at Stanford Linear Accelerator Center, Stanford University, 1989-1998, via initial concepts and leadership role in its design
- Pioneered femto-techniques and co-principal investigator of the team that produced world's first **Femtosecond X-ray and Electron Bursts** for studies of Ultrafast Processes, 1996 and 1999: October 11, 1996 (p. 236) and March 24, 2000 (p. 2237) issue of *Science*
- Founder/Director, **Center for Beam Physics** @ Lawrence Berkeley National Laboratory of Univ. of California, 1991-2001 (a staff of 40 scientists, engineers and administrative personnel), including creation of the

### **Lambertson Beam Electrodynamics Laboratory and the l'OASIS Laboratory**

- Founder of two Centers of Excellence at Jefferson Lab in 2001: **Center for Advanced Studies of Accelerators (CASA)** and **Institute for Superconducting Radio Frequency Science and Technology (ISRFST)**
- Construction and commissioning of the **1 GeV Superconducting linac for SNS** at Oakridge
- Established **Energy Recovering Linac research** as a strategic program at Jefferson Lab
- Achieved **full recovery of the CEBAF** accelerator complex after the **2003 Hurricane Isabel**
- Led the Jefferson Lab program achieving **Superconducting RF performance at the BCS Limit of Niobium, 2005**
- **Energy Recovery in ALICE** at the **Cockcroft Institute** at **Daresbury, UK in 2008**

### **AWARDS and HONORS:**

- (i) **Fellow**, American Physical Society (APS), 1994, USA
- (ii) **Fellow**, American Association for the Advancement of Science (AAAS), 2005, USA
- (iii) **Fellow**, Institute of Physics (IoP), 2006, UK
- (iv) **Meghnad Saha Memorial Lecture Award**, 2006, Saha Institute of Nuclear Physics, Kolkata, India.
- (v) **Raja Ramanna Inaugural Lecture Award**, 2005, DAE, India
- (vi) **Halbach Prize**, 1996, LBL, USA (team award) for “*production of femto-second x-rays*”
- (vii) **Certificate of Distinction for Mentorship in Energy Research Undergraduate Laboratory Fellowship (ERULF) Program**, Award by US Department of Energy, 1998
- (viii) **Mentorship Certificate, New Horizons Governor’s School for Science and Technology, Virginia, 2002**
- (ix) **Certificate of Merit** for Technology Transfer, LBNL, 1991
- (x) JAERI (Japan Atomic Energy Research Institute), **Distinguished Visiting Scientist**, Japan, 1995
- (xi) **National Scholar**, 1967, Govt. of India
- (xii) **National Science Talent Scholar**, 1967-69, Govt. of India
- (xiii) **2000 Outstanding Scientists of the Twentieth Century Award** by the International Biographical Center, Cambridge, England, 2000, for “*Outstanding Contributions in Particle Physics, Beams and Femtoscience*”
- (xiv) **John Adams Institute Inaugural Lecture**, 2004, Oxford University, UK
- (xv) **Sir John Cockcroft Chair of Physics Inaugural Lecture**, 2008, University of Liverpool

### **MEMBERSHIPS AND AFFILIATIONS:**

**Board Member:** Governor’s Advisory Board on Virginia Biotechnology Initiative, 2002-2005; **Member:** American Physical Society (APS), Institute of Physics (IoP), American Association for the Advancement of Science (AAAS); International Committee on Future Accelerators (ICFA) Beam Dynamics Panel; European Physical Society (EPS); American Chapter of the Indian Physics Association (ACIPA); Optical Society of America (OSA); **Senior Member** of IEEE (Institute of Electrical and Electronics Engineers); **Executive Board Member** of the Division of Physics of Beams of APS/USA, 200-2003; **Vice-Chair, Chair-elect and Chair:** APS Division of Physics of Beams, 2007-2009; **Advisory Board** Member to International Particle Accelerator Conference (IPAC), International Linac Conferences, Particle Accelerator Conferences (PAC) and European Particle Accelerator Conferences (EPAC); **Reviewer and Referee** for: Phys. Rev., Phys. Rev. Lett., NIMPR-A and various DOE, NSF and University-Laboratory Research Proposals; **Editor-in-Chief**, Western Hemisphere, of the international journal *Particle Accelerators*, 1992-2000; **Series Editor**, “The Physics and Technology of Particle and Photon Beams”, monograph series by Harwood Academic Publishers, 1993-2001; **Editor**, Physical Review Special Topics -- Accelerator and Beams (PRST--AB), January 2003--2005.

### **RESEARCH INTERESTS:**

Particle and nuclear physics (CP violation symmetry principles, quark confinement, quark-gluon structure of nuclei and nucleus, astrophysics and cosmology); beam physics and accelerator technology; synchrotron

radiation; free electron lasers; laser-beam-plasma physics; nonlinear dynamics; collider physics; novel concepts in accelerators and radiation sources; ultra-fast processes; quantum optics and quantum computers; classical and quantum statistical physics and many-body problems.

## **INTERNATIONAL PROFILE:**

Contributed to establishing accelerator science and technology in South Korea, Taiwan and India via mentorship and transfer of scientists. Contributed to the development of the third generation synchrotron radiation sources world-wide (SLS in Switzerland, Sincrotrone Trieste in Italy, Pohang Light Source in South Korea, SRRC in Taipei, Taiwan and INDUS I & II in the Center for Advanced Technology in Indore, India) via direct involvement in their conception and design, training of scientists, participation in strategic decisions and prolonged visits. Active member of the Forum on International Physics and Forum on Physics and Society of APS.

### ***Development of Beam Physics and Accelerator Technology Base in ASIA***

While Dr. Swapan Chattopadhyay was responsible for supervising the design, construction and commissioning of the Advanced Light Source at Berkeley, and for leading and directing the Exploratory Studies Group (now grown into the Center for Beam Physics) at LBNL, he hosted and looked after the professional training and development of various scientists from South Korea, People's Republic of China, Taiwan, India and Japan. These scientists later returned to their respective home countries and today they are significant founders and contributors to major accelerators and accelerator start-ups all over ASIA (they are listed later).

Dr. Chattopadhyay was personally involved in some design decisions and strategies for the design of the Pohang Light Source (PLS) in Korea, the SRRC in Taiwan, INDUS I and II in India.

Dr. Chattopadhyay is responsible for the exchange of information on the design of the Shanghai Light Source and the Beijing Tau-Charm Factory via exchange of scientists on beam dynamics and radiofrequency work.

As the Editor-in-Chief (Western Hemisphere) of the international journal Particle Accelerators, Dr. Chattopadhyay had placed a significant scientific leader from Asia, Prof. Y. Kimura of KEK, Japan as the Editor-in-Chief of the Far East by suggestions to Prof. Eberhard Keil, the Executive Director. He also placed Prof. Dr. Namkung of the POSTECH and PLS (Korea), on the Editorial Board in the Far Eastern section of this visible international journal, with consent from Prof. Y. Kimura of KEK.

Dr. Chattopadhyay was the invited JAERI Distinguished Scientist in 1995 and initiated the research on the Optical manipulation of Beams at the JAERI-RIKEN Spring-8 facility and the newly formed Laser Laboratory in Nara, Japan. Contributed to various Japanese collider projects (JLC, KEK-B) via exchange of personnel.

Prof. Chattopadhyay advised leaders and directors of various institutions (Dir. Iizumi of JAERI (Japan), Dir. Kamitsubo of SPring-8 (Japan), Dr. Richard Sah of SRRC (Taiwan), Dr. Namkung of PLS (Korea), Dr. Bhawalkar of CAT (India) and Dr. B. Sinha of VECC in Calcutta (India)) on various accelerator projects.

### ***Mentoring and hosting scientists from developing countries including Japan & Former Soviet Union.***

Mentorship of scientists and students from South, South-East and Far -East Asia via (i) personal tutelage, (ii) training under the Center for Beam Physics and under the Accelerator/Engineering Group and (iii) placement in the most forward-looking developing and emerging technological institutions across Asia.

#### **SOUTH KOREA:**

**Dr. In-Soo Ko**, Ph.D, (UCLA, 1986): Theoretical Plasma Physics. At Berkeley from 1987-1988 training under and contributing to the design of the Advanced Light Source at LBNL and simultaneously to the PLS in South Korea. At PLS, was responsible for the Beam Dynamics investigations and was the designated Deputy Director for the LINAC and Injection Systems. Present Position: Faculty at POSTECH and PLS.

**Dr. Yang-Mo Koo**, Ph.D. (Northwestern U.): Solid State Physics. At Berkeley from 1987-88 designing magnets for the ALS and the PLS under training. Present Position: Deputy Director, PLS.

**Dr. Jeong Sik Choi**, Ph.D. At Berkeley from 1990-1991 training in FEL theory. Present Position: In South Korea, unknown institution.

**Dr. Sang June Hahn**, Ph.D. At Berkeley 1993-1994 training in FEL theory. Present Position: Professor, Jung-Ang University; Leader, FEL Theory. Started FEL Group there.

**Dr. Soo-Ill Kwon**, Ph.D. At Berkeley 1992-1993 training in beam physics and FEL theory. Present position: in South Korea, unknown institution.

**Dr. Kun Quan Sun**, Ph.D. At Berkeley in 1995 training in beam physics. Present Position: In South Korea, unknown institution.

**Dr. Eun Sun Kim**, Ph.D. (KEK): Beam Dynamics in Storage Rings. At Berkeley from 1998-2000 studying colliders, instabilities and muons storage rings for US and Japanese high energy physics projects. Training in storage ring physics. Present Position: Scientist at PLS (fixed the coupled bunch motion upon arrival there within a short time).

#### JAPAN

**Dr. Yong Ho Chin**, Ph.D. (KEK), Accelerator Theorist. At Berkeley 1987 till 1994 contributing to B-factory, 3-D FEL theory, Beam-Beam Interaction and general accelerator physics. Was instrumental back at KEK in Japan for the start of the B-factory in Japan and the formation of the general Asian Particle Accelerator activity. Present Position: Professor, KEK, Japan.

**Dr. Hiromi Okamoto**, Ph.D. At Berkeley from 1992-1993 studying crystalline beams and FELs. Present Position: Professor, Kyoto University, responsible for starting the Beam Physics activity at Kyoto Univ.

**Dr. Y. Kishimoto**, Ph.D. (Plasma Physics. At Berkeley in 1996-1997 collaborating on Optical manipulation of Beams and Optical Stochastic Beam Cooling. Present Position: Staff Scientist, JAERI, Naka-Tokai-Mura, Japan.

**Dr. J. Koga**, Ph.D. Plasma Physics. At Berkeley in 1996-1997 collaborating on Optical manipulation of Beams and Optical Stochastic Cooling. Present Position: Staff Scientist, JAERI.

**Mr. Y. Watanabe**, Ph.D. student at U. of Tokyo with Prof. Uesaka. At Berkeley from 1998-1999, training in fluctuation theoretic beam diagnostics. Present Position: Doctoral Research at U. of Tokyo. Helped develop further Prof. Uesaka's Quantum Beam Femto-laboratory.

**Dr. Tomomi Ohgaki**, Ph.D. (Kyoto Univ.). At Berkeley from 1998-2000 training in electron-positron-gamma collisions. Present Position: Kyoto University.

#### PEOPLE'S REPUBLIC OF CHINA

**Changbiao Wang**, at Berkeley, 1991-1993. Trained in two-beam accelerators, FELs, beam dynamics and RF. Present position: being trained further at Yale University.

**Wenfu Du**, at Berkeley 1994-1995. Present Position: Unknown.

**Yaolin Sun**, at Berkeley 1994-1995. Present Position: unknown.

**KangZhu Guo**, at Berkeley 1996-1999, on formal exchange program from IHEP, China on Sino-US collaboration. Graduate works at our Center while a doctoral student at IHEP. Present Position: further training as graduate student at Rutgers University.

**Gui Mei**, at Jefferson Lab, 2006-2009, studying SRF, ERL and SC IR FELs. Now at BNL.

#### TAIWAN

**Dr. Wen-Hao Cheng**, Ph.D. (Univ. of Maryland), at Berkeley 1995-1997, studying Beam Dynamics, Instabilities in Colliders. Present Position: Industry.

#### INDIA

**Dr. Govindan Rangarajan**, Ph.D. (Univ. of Maryland): Nonlinear Dynamics. At Berkeley from 1990-1992 and 1995 working on FELs, nonlinear moment maps, etc.. Present Position: Professor, Indian Institute of Science at Bangalore. Responsible for starting the Beam Physics Program there.

**Dr. Srinivas Krishnagopal**, Ph.D. (Cornell University): Accelerator Physics. At Berkeley from 1990-1992 and 1999 working on FELs and Beam-Beam Effects in colliders. Present Position: Scientist and Project Leader, Center for Advanced Technology, Indore, India. Responsible for initiating the infrared FEL project there.

**Dr. Vinod Krishnan**, Ph.D. Plasma Astrophysicist. At Berkeley in 1993-1994. Present Position: Indian Institute of Astrophysics, Bangalore.

**Ms. Shakti Kosta**, Doctoral Student from CAT, India. At Berkeley from 1998-1999 working on thesis topic on Beam Electrodynamics of RF cavities. Present Position: In India, institution unknown.

**Dr. Ranjan Ray**, Ph.D. (U. of Oregon): Solid State Physics. At Berkeley in 1998 as Fulbright Scholar training in Beam Physics. Present Position: Professor in St. Xavier's College, Calcutta University. Responsible for starting the interdisciplinary course on beams.

**Dr. Subal Kar**, Ph.D. (Calcutta University): Radio-physicist. At Berkeley from 1999-2000 working on Beam Electrodynamics of RF cavities. Present Position: Associate Professor, Calcutta University. Responsible for initiating RF research there.

#### FORMER SOVIET UNION

**Dr. Irina Dubovskaya**, Ph.D. At Berkeley in 1991 researching Parametric Radiation. Present Position Unknown.

**Mikhail Faiguenblat** At Berkeley from 1995-1996. Present Position: Unknown.

**Dr. Adolf Dzergach**, Ph.D.: Beam Physicist At Berkeley in 1998 working on Two-Beam Accelerator. Present Position: Moscow, responsible for starting the two-beam accelerator program there.

### *SELECTED PUBLICATIONS*

#### **Femtosecond X-rays and Electrons**

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## **SPECIAL EDITORSHIPS OF BOOKS AND PROCEEDINGS**

Series Editor, "The Physics and Technology of Particle and Photon Beams" — a series of monographs published by Harwood Academic Publishers (Vol. 1-7, Vol. 8 under preparation).

Guest Editor, Special Issue "Impedance Beyond Cutoff," *Particle Accelerators*, 1990, Vol. 25, No. 2-4.

Guest Editor, Special Issue "Post-Accelerator Issues at the Isospin Laboratory," *Particle Accelerators*, 1994, Vol. 47, No. 3-4.

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