Curriculum Vitæ

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Octubre 2001

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DATOS PERSONALES

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Empleos previos INFN Post-Doctoral Fellow, con el Prof. Modesto Pusterla
Dipartimento di Fisica Galileo Galilei, Università di Padova
Istituto Nazionale di Fisica Nucleare (**INFN**)
Sezione di Padova, ITALY
(del 27 de Octubre 1997 al 26 de Octubre 1999)

Junior Research Fellow (JRF)
The Institute of Mathematical Sciences, Chennai (Madras) INDIA

Formación Académica:

B.Sc. Honours (Física)	1988, Osmania University, Hyderabad
M.Sc. (Física)	1990, Indian Institute of Technology (IIT), Kanpur
Ph.D	1997, The Institute of Mathematical Sciences, Chennai (Madras)
Título de la tesis:	*Quantum theory of charged-particle beam optics*
Tópico de la tesis:	Desarrollo de técnicas matemáticas para el transporte de haces de partículas cargadas mediante campos electromagnéticos.
Supervisor de tesis:	Prof. R. Jagannathan

Campo de investigación: Física de haces de partículas con spin y fotones
Optica de aceleradores y microscopía electrónica
Desarrollos en series de aberraciones
Geometría simpléctica del espacio fase.

DISTINCIONES Ganador de la Olimpiada en Matemáticas (nivel estatal):
Junior Level (1983)
Senior Level (1985) y Degree Level (1986 a 1988)

Conferencia invitada en el Young Physicists Colloquium
Kolkata (Calcutta), Agosto 1996

PUBLICACIONES

A. Publicaciones arbitradas:

- S. A. Khan y R. Jagannathan,
On the quantum mechanics of charged particle beam transport through magnetic lenses,
Phys. Rev. **E 51**, 2510–2515 (1995).

- R. Jagannathan y S. A. Khan,
Quantum theory of the optics of charged particles,
Advances in Imaging and Electron Physics, *Editores*: P. W. Hawkes, B. Kazan y T. Mulvey,
(Academic Press, San Diego, 1996) **Vol. 97**, pp. 257–358 (1996).

- M. Conte, R. Jagannathan, S. A. Khan y M. Pusterla,
Beam optics of the Dirac particle with anomalous magnetic moment,
Preprint: IMSc/96/03/07, INFN/AE-96/08
Particle Accelerators **56**, 99–126 (1996).

- Sameen Ahmed Khan y M. Pusterla,
  Quantum-like approach to the transversal and longitudinal beam dynamics. The halo problem,
  Euro. Phys. Journal **A 7** No. 4, 583–587 (2000).

- Sameen Ahmed Khan y M. Pusterla,
  On the form of Lorentz-Stern-Gerlach force,
  (*sometido*).

- R. Jagannathan, S. A. Khan y R. Simon,
  Foldy-Wouthuysen transformation and a quasiparaxial scheme for the scalar wave theory of light beams,
  (*sometido*).

B. Memorias in extenso y preimpresos

- S. A. Khan y R. Jagannathan,
  Theory of relativistic electron beam transport based on the Dirac equation,
  en: *Proceedings of the 3rd National Seminar on Physics and Technology of Particle Accelerators and their Applications* **PATPAA-93** (25–27 November 1993, Kolkata (Calcutta)),
  Editor: S. N. Chintalapudi (IUC-DAEF, Kolkata (Calcutta)), pp. 102–107.

- S. A. Khan y R. Jagannathan,
  Quantum mechanics of charged particle beam optics: An operator approach,
  Preprint: IMSc-94/11 Presentado en el **JSPS–KEK** International Spring School on High Energy Ion Beams — Novel Beam Techniques and their Applications, Japón, 17–29 Marzo 1994.

- R. Jagannathan y S. A. Khan,
  Wigner functions in charged particle optics,
  en: Selected Topics in Mathematical Physics — Professor R. Vasudevan Memorial Volume,
  Editores: R. Sridhar, K. Srinivasa Rao, y V. Lakshminarayanan
  (Allied Publishers, Delhi, 1995), pp. 308–321.

- S. A. Khan,
  Transport of Dirac-particle beams through magnetic quadrupoles,
  `Preprint: IMSc/96/33` (The Institute of Mathematical Sciences, Chennai (Madras), Dic. 1996).

- R. Jagannathan y S. A. Khan,
  Quantum mechanics of accelerator optics,
  ICFA Beam Dynamics Newsletter, **13**, pp. 21–27 (April 1997).
  (**ICFA**: International Committee for Future Accelerators).

- S. A. Khan,
  Quantum theory of magnetic quadrupole lenses for spin-$\frac{1}{2}$ particles,
  en: *Proceedings of the 15th Advanced ICFA Beam Dynamics Workshop on Quantum Aspects of Beam Physics*, (04–09 Enero 1998, Monterey, California USA),
  Editor: Pisin Chen, (World Scientific, Singapore, 1999), pp. 682–694.

- Sameen A. Khan,
  Quantum aspects of accelerator optics,
  en: Proceedings of the *1999 Particle Accelerator Conference* **PAC99**,
  (29 March – 02 April 1999, New York City, NY), *Editores*: A. Luccio y W. MacKay,
  (IEEE Catalogue Number: 99CH36366) pp. 2817–2819.

- Sameen A. Khan y M. Pusterla,
  Quantum mechanical aspects of the halo puzzle,
  en: Proceedings of the *1999 Particle Accelerator Conference* **PAC99**
  (29 March – 02 April 1999, New York City, NY), *Editores*: A. Luccio y W. MacKay,
  (IEEE Catalogue Number: 99CH36366) pp. 3280–3281.

- Sameen A. Khan y M. Pusterla,
  Quantum-like approaches to the beam halo problem,
  en: Proceedings of the *6th International Conference on Squeezed States and Uncertainty Relations* **ICSSUR'99**, (24–29 Mayo 1999, Napoli, Italy) (NASA Conference Publication Series).

- Sameen A. Khan y M. Pusterla,
  Beam currents in HIF,
  Por aparecer en: Proceedings of the *13th International Symposium on Heavy Ion Inertial Fusion* **HIF2000**, (13–17 March 2000, San Diego, USA)
  Nuclear Instruments and Methods in Physics Research **NIMS A**.
  (*sometido*).

- S. A. Khan,
  Quantum formalism of beam optics,
  en: *Proceedings of the 18th Advanced ICFA Beam Dynamics Workshop on Quantum Aspects of Beam Physics* (15–20 Octubre 2000, Capri, Italy), *Editor*: Pisin Chen,
  (World Scientific, Singapore, 2001), pp. ???-???.
  (*en prensa*).

C. Artículos en preparación

- R. Jagannathan, S. A. Khan y R. Simon,
  On the scalar wave theory of quasiparaxial beam optics.

- R. Jagannathan, S. A. Khan y R. Simon,
  On the Maxwell optics of quasiparaxial beams.

- M. Conte, R. Jagannathan, S. A. Khan y M. Pusterla,
  A quantum mechanical formalism for studying the transport of Dirac-particle beams through magnetic optical elements in accelerators.

OTROS ESCRITOS

- Sameen A. Khan,
  The International Center for Theoretical Physics—A Personal Impression,
  Al-Nahl, *Número especial sobre el Dr. Abdus Salam*, **8**, pp. 122–124 (Otoño 1997).
  (**Al-Nahl**: A quarterly publication of Majlis Ansarullah, USA).
- Sameen Ahmed Khan,
  Call for Creation of Accelerator & Beam Physics Forums,
  ICFA Beam Dynamics Newsletter, **17**, pp. 5–6 (Agosto 1998).
  (**ICFA**: International Committee for Future Accelerators).
- Sameen Ahmed Khan and Modesto Pusterla,
  Call for Creation of Accelerator & Beam Physics Division
  (in the European Physical Society),
  (*comunicado*).
- Sameen Ahmed Khan,
  Salam's Bright Idea,
  Carta en *Physics World*, **12** (11), pp. 15 (Noviembre 1999).
- Sameen Ahmed Khan,
  Salam Inspired Plans for Mideast Synchrotron,
  Carta en *Physics Today*, **53** (1), pp. 78 (Enero 2000).
- Sameen Ahmed Khan,
  Opening SESAME,
  Carta en *CERN Courier*, **40** (3), pp. 38 (Abril 2000).
  (**CERN**: European Organization for Nuclear Research).
- Sameen Ahmed Khan,
  Jordan to host Middle East Synchrotron,
  ICFA Beam Dynamics Newsletter, **22**, pp. 6–7 (Agosto 2000).
  (**ICFA**: International Committee for Future Accelerators).
- Sameen Ahmed Khan, **SESAME: The First Synchrotron Facility in the Middle East**,
  AAPPS Bulletin, **10** (2), pp. 36–39 (Diciembre 2000).
  (**AAPPS**: Association of Asia Pacific Physical Societies).

- Sameen Ahmed Khan,
  The Middle East Synchrotron Laboratory and India,
  Current Science, **80** (2), pp. 130–132 (25 Enero 2001).

- Sameen Ahmed Khan,
  The Story of the Relocated Synchrotrons,
  Indian Science Cruiser, **15**, No. 2, 26–30 (Abril 2001).

- Sameen Ahmed Khan,
  The World of Synchrotrons,
  (*en prensa*).

Actividades Académicas

- 07–15 Noviembre 1993
  The CERN Accelerator School: Physics & Engineering for Particle Accelerators,
  Tuvo lugar en: Centre for Advanced Technology (**CAT**), Indore, India.

- 25–27 Noviembre 1993
  3rd National Seminar on Physics and Technology of Particle Accelerators and their Applications PATPAA-93. *Tuvo lugar en*: **IUC-DAEF**, Kolkata (Calcutta) Centre, India,
  Poster: **Theory of relativistic electron beam transport based on the Dirac equation**.

- 17–29 Marzo 1994
  JSPS–KEK International Spring School: High Energy Ion Beams—Novel Beam Techniques and their Applications, *Tuvo lugar en*:
  National Laboratory for High Energy Physics (**KEK**)
  Institute of Nuclear Study (**INS**)
  Institute of Physical and Chemical Research (**RICKEN**)
  Conferencia: **Quantum mechanics of charged particle beam optics: An operator approach**.

- 23 Enero – 10 Febrero 1995
  SERC School* **on Coherence and Correlations in Modern Optics and Quantum Physics**,
  Tuvo lugar en: The Institute of Mathematical Sciences, Chennai (Madras), India
  Conferencia: **Charged Particle Optics — A Wigner function approach**.

- 10–12 Noviembre 1995
  61st Annual Meeting of Indian Academy of Science,
  Tuvo lugar en: Chennai (Madras), India.

*Actively involved in capacity as the **Member of the Local Organizing Committee** and **Publicity Secretary**

- 22–23 Agosto 1996
  Young Physicists Colloquium,
  Organizado por: The Indian Physical Society (**IPS**), Kolkata (Calcutta), India,
  Conferencia: **Beam optics of the Dirac particle**.

- 10–15 Enero 1997
  International Conference on Dynamical Systems,
  Tuvo lugar en: The Indian Institute of Science, Bangalore, India,
  Poster: **Transport of Dirac-particle beams through magnetic quadrupoles**.

- 13–25 Enero 1997
  School on Physics of Beams,
  Tuvo lugar en: Centre for Advanced Technology (**CAT**), Indore, India,
  Conferencia: **Beam optics of the Dirac particle**.

- 03–21 Marzo 1997
  Winter College on Quantum Optics: Novel Radiation Sources,
  Tuvo lugar en: International Centre for Theoretical Physics (**ICTP**), Trieste, Italia,
  Conferencia: **Quantum mechanical approach to beam physics**.

- 25–27 Marzo 1997
  Istituto Nazionale di Fisica Nucleare (**INFN**),
  Sezione di Padova, Padova, Italia.

- 19–22 Noviembre 1997
  Salam Memorial Meeting
  Tuvo lugar en: The Abdus Salam International Centre for Theoretical Physics (**ICTP**), Trieste, Italia.

- 09–13 Diciembre 1997
  Istituto Nazionale di Fisica Nucleare (**INFN**),
  Sezione di Naples, Naples, Italia.

- 04–09 Enero 1998
  15th Advanced ICFA Beam Dynamics Workshop on Quantum Aspects of Beam Physics,
  Monterey, California, USA,
  Conferencia: **Quantum theory of magnetic quadrupole lenses for spin-$\frac{1}{2}$ particles**.

- 12–14 Enero 1998
  Center for Beam Physics,
  Ernest Orlando Lawrence Berkeley National Laboratory (**LBNL**),
  University of California, Berkeley, USA.

- 19–30 Enero 1998
  US Particle Accelerator School USPAS,
  University of Texas at Ausin, Austin, USA.

- 13–15 Mayo 1998
  Workshop on Non-Linear Problems in Charged-Particle Beam Transport in Linear and Recirculated Accelerators, Analysis of Transverse and Longitudinal Instabilities,
  Tuvo lugar en: Italian National Agency for New Technology, Energy and Environment (**ENEA**), Frascati, Italia,
  Conferencia: **Quantum methodology in beam physics**.

- 28 Junio – 05 Julio 1998
  Deutsches Elektronen-Synchrotron (**DESY**),
  Hamburg, Alemania.

- 09–10 Noviembre 1998
  Fermi National Accelerator Laboratory (**Fermilab**),
  Batavia, Illinois, USA.

- 12–13 Noviembre 1998
  Brookhaven National Laboratory (**BNL**),
  Upton, New York, USA.

- 20–26 Marzo 1999
  Centennial Meeting of the American Physical Society,
  Tuvo lugar en: Atlanta, Georgia, USA,
  Conferencia: **Quantum aspects of charged-particle beam optics**.

- 29 Marzo – 02 Abril 1999
  1999 Particle Accelerator Conference (PAC99),
  Tuvo lugar en: New York City, USA,
  Poster-I: **Quantum aspects of accelerator optics**,
  Poster-II: **Quantum mechanical aspects of the halo puzzle**.

- 24–29 Mayo 1999
  6th International Conference on Squeezed States and Uncertainty Relations (**ICSSUR'99**),
  Tuvo lugar en: Dipartimento di Scienze Fisiche, Università di Napoli "Federico II", Napoli, Italia,
  Poster: **Quantum-like approaches to the beam halo problem**.

- 15–17 Diciembre 1999.
  National Laser Symposium (**NLS-1999**),
  Tuvo lugar en: School of Physics, University of Hyderabad,
  Hyderabad, India.

- 29 Enero – 29 Febrero 2000
  The Institute of Mathematical Sciences (**Matscience**),
  Chennai (Madras), India.

- 15–20 Octubre 2000
  18th Advanced ICFA Beam Dynamics Workshop on Quantum Aspects of Beam Physics,

Capri, Italia,
Conferencia: **Quantum formalism of beam optics**.

- 21–26 Octubre 2000
  Dipartimento di Fisica,
  Università di Salerno,
  Salerno, Italia.

- 23 Octubre 2000
  Mini Workshop on Quantum Methodologies in Beam Physics,
  Tuvo lugar en: Dipartimento di Fisica,
  Università di Salerno,
  Salerno, Italia,
  Conferencia:

- 18–22 Diciembre 2000
  XIV DAE Symposium on High Energy Physics,
  Tuvo lugar en: School of Physics,
  University of Hyderabad,
  Hyderabad, India.

MEMBRESÍAS ANUALES

- **American Physical Society**
  - The Division of Atomic, Molecular, and Optical Physics (DAMOP)
  - The Division of Physics of Beams (DPB)
  - Forum on Education (FEd)
  - Forum on International Physics (FIP)
- **European Physical Society**
  - Quantum Electronics and Optics Division
  - Interdivisional Group on Accelerators
- **International Association of Mathematical Physics**
- **International Radiation Physics Society**
- **Società Italiana di Fisica**

- **Astronomical Society of India**

MEMBRESÍAS PERMANENTES

- **Indian Physical Society**
  IPS
  `Membresía permanente No. IPS/LM/95`
  Department of Material Science
  Indian Association for Cultivation of Science
  Jadavpur
  KOLKATA (CALCUTTA) 700032

- **Indian Physics Association**
  IPA
  `Membresía permanente No. MAS/LM/10896`
  Tata Institute of Fundamental Research
  Homi Bhabha Road
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  MUMBAI (BOMBAY) 400005

- **Optical Society of India**
  OSI
  `Membresía permanente No. L 225`
  Department of Applied Physics
  University of Calcutta
  92, Acharya Prafulla Chandra Road
  KOLKATA (CALCUTTA) 700009

- **Indian Laser Association**
  ILA
  `Membresía permanente No. LM/348`
  Laser Research & Development Block-B
  Centre for Advanced Technology (**CAT**)
  Post: CAT Rajendranagar
  INDORE 452013

- **Materials Research Society of India**
  MRSI
  `Membresía permanente No. L 1069`
  Defence Metallurgical Research Laboratory
  P.O Kanchanbagh
  HYDERABAD 500258

- **Indian Society of Atomic and Molecular Physics** $\mathcal{ISAMP}$
  `Membresía permanente No.`
  Physical Research Laboratory $\mathcal{PRL}$
  Navrangpura
  AHMEDABAD 380009

- **Indian Association of Physics Teachers**
  $\mathcal{IAPT}$
  `Membresía permanente No. 5304-L2529`
  L–117/302
  Naveen Nagar
  KANPUR 208025

- **Indian Society for Technical Education**
  $\mathcal{ISTE}$
  `Membresía permanente No. LM 24901`
  Indian Institute of Technology Campus
  Hauz Khas
  NEW DELHI 110016

- **Plasma Science Society of India**
  $\mathcal{PSSI}$
  `Membresía permanente No. L-415`
  Institute for Plasma Research
  Bhat
  GANDHINAGAR 382424

- **Indian Association for General Relativity and Gravitation** $\mathcal{IAGRG}$
  `Membresía permanente No.`
  Inter-University Centre for Astronomy and Astrophysics
  Post Bag 4, Ganeshkhind
  PUNE 411007

- **Electrochemical Society of India**
  $\mathcal{ECSI}$
  `Life Fellow Membership No. F-214`
  Indian Institute of Science Campus
  BANGALORE 560012

- **Solar Energy Society of India**
  $\mathcal{SESI}$
  `Membresía permanente No. 0949/LM/2000`
  Tata Energy Research Institute
  Darbari Seth Block
  Habitat Place, Lodhi Road

NEW DELHI 110003

- **Magnetics Society of India**
  $\mathcal{MSI}$
  `Membresía permanente No. LM-211`
  Defence Metallurgical Research Laboratory
  P.O Kanchanbagh
  HYDERABAD 500258

- **Forum of Scientists, Engineers & Technologists** $\mathcal{FOSET}$
  `Membresía permanente No. LM/2001-1187`
  15 N, Lindsay Street
  New CMC Building (5th Floor)
  KOLKATA (CALCUTTA) 700087

- **Indian Science Congress Association**
  $\mathcal{ISCA}$
  `Membresía permanente No. 8544`
  14, Dr. Biresh Guha Street
  KOLKATA (CALCUTTA) 700017

- **Institute of Science, Education & Culture**
  $\mathcal{ISEC}$
  `Membresía permanente No.`
  ISEC House, 42–B, Syed Amir Ali Avenue
  KOLKATA (CALCUTTA) 700017

- **Ramanujan Mathematical Society**
  $\mathcal{RMS}$
  `Membresía permanente No.`
  Ramanujan Institute for Advanced Studies in Mathematics
  University of Madras
  CHENNAI (MADRAS) 600005

- **Society for Special Functions and their Applications** $\mathcal{SSFA}$
  `Membresía permanente No. 321`
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- **Indian Academy of Mathematics**
  $\mathcal{IAM}$
  `Membresía permanente No.`
  15, Kaushaliyapuri

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INDORE 452001

- **Association of Mathematics Teachers of India** $\mathcal{AMTI}$
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- **Indian Statistical Institute**
  $\mathcal{ISI}$
  `Membresía permanente No. L/7827`
  203, Barrackpore Trunk Road
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- **Indian Statistical Association**
  $\mathcal{ISA}$
  `Membresía permanente No.`
  Department of Statistics
  University of Poona
  PUNE 411007

- **Operational Research Society of India**
  $\mathcal{ORSI}$
  `Membresía permanente No. 0476/S/00/ML`
  39, Mahanirvan Road
  KOLKATA (CALCUTTA) 700029

- **Computer Society of India**
  $\mathcal{CSI}$
  `Membresía permanente No. 00059965`
  122, T. V. Industrial Estate
  S. K. Ahire Marg
  MUMBAI (BOMBAY) 400025

- **The Society for Progress of Science**
  $\mathcal{SPS}$
  `Membresía permanente No.`
  Pragati Prakashan
  Post Box No. 62
  New Market Begum Bridge
  MEERUT 250001

- **Indian Adult Education Association**
  IAEA
  `Membresía permanente No.`
  Shafiq Memorial
  17 B, Indraprastha Estate
  NEW DELHI 110002

- **Regional Science Association**
  RSA
  `Membresía permanente No. 380`
  CK–134, Sector-II
  Salt Lake City
  KOLKATA (CALCUTTA) 700091

- **All India Association for Educational Research** *AIAER*
  `Membresía permanente No.`
  N1/55
  IRC Village
  BHUBANESWAR 751015

- **Indian Library Association**
  ILA
  `Membresía permanente No. SL/5093`
  A/40–41, Flat No. 201
  Ansal Building
  Dr. Mukherjee Nagar
  NEW DELHI 110009

- **Indian Association of Special Libraries & Information Centres** *IASLIC*
  `Membresía permanente No.`
  P 291, CIT Scheme 6M
  Kankurgachi
  KOLKATA (CALCUTTA) 700054

- **All India Muslim Educational Society**
  AIMES
  `Membresía permanente No.`
  A–1–D, Anugraha
  19, Nungambakkam High Road
  CHENNAI (MADRAS) 600034

- **The Muslim Asociation for the Advancement of Science** *MAAS*
  `Life Associate No. 9701B130`

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- **Indian Association of Muslim Social Scientists** $\mathcal{IAMSS}$
  Membresía permanente No.
  162, Jogabai Extension
  Jamia Nagar
  NEW DELHI 110025

- **Indian Association for Islamic Economics** $\mathcal{IAFIE}$
  Membresía permanente No.
  4–1212, Sir Syed Nagar
  ALIGARH 202002