

Curriculum Vitæ

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DATOS PERSONALES

Fecha de nacimiento: 17 de Agosto 1966
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Posición post-doctoral Investigador responsable: Dr. Kurt Bernardo Wolf
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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:	<i>Quantum theory of charged-particle beam optics</i>
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
 Óptica 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 (FEEd)
 - 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

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Homi Bhabha Road

Colaba

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- **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

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- **Materials Research Society of India**

MRSI

Membresía permanente No. L 1069

Defence Metallurgical Research Laboratory

P.O Kanchanbagh

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- **Indian Society of Atomic and Molecular Physics *ISAMP***
Membresía permanente No.
Physical Research Laboratory *PRL*
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- **Indian Association of Physics Teachers**
IAPT
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- **Indian Society for Technical Education**
ISTE
Membresía permanente No. LM 24901
Indian Institute of Technology Campus
Hauz Khas
NEW DELHI 110016
- **Plasma Science Society of India**
PSSI
Membresía permanente No. L-415
Institute for Plasma Research
Bhat
GANDHINAGAR 382424
- **Indian Association for General Relativity and Gravitation *IAGRG***
Membresía permanente No.
Inter-University Centre for Astronomy and Astrophysics
Post Bag 4, Ganeshkhind
PUNE 411007
- **Electrochemical Society of India**
ECST
Life Fellow Membership No. F-214
Indian Institute of Science Campus
BANGALORE 560012
- **Solar Energy Society of India**
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**
MSI
Membresía permanente No. LM-211
Defence Metallurgical Research Laboratory
P.O Kanchanbagh
HYDERABAD 500258

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

- **Indian Science Congress Association**
ISCA
Membresía permanente No. 8544
14, Dr. Biresw Guha Street
KOLKATA (CALCUTTA) 700017

- **Institute of Science, Education & Culture**
ISEC
Membresía permanente No.
ISEC House, 42-B, Syed Amir Ali Avenue
KOLKATA (CALCUTTA) 700017

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

- **Society for Special Functions and their Applications *SSFA***
Membresía permanente No. 321
Department of Mathematics
Aligarh Muslim University
ALIGARH 202002

- **Indian Academy of Mathematics**
IAM
Membresía permanente No.
15, Kaushaliyapuri

Chitawad Road
INDORE 452001

- **Association of Mathematics Teachers of India *AMTI***

Membresía permanente No.
B-19, Vijay Avenue
Old No. 37, New No. 85
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- **Indian Statistical Institute**

ISI
Membresía permanente No. L/7827
203, Barrackpore Trunk Road
KOLKATA (CALCUTTA) 700035

- **Indian Statistical Association**

ISA
Membresía permanente No.
Department of Statistics
University of Poona
PUNE 411007

- **Operational Research Society of India**

ORSI
Membresía permanente No. 0476/S/00/ML
39, Mahanirvan Road
KOLKATA (CALCUTTA) 700029

- **Computer Society of India**

CSI
Membresía permanente No. 00059965
122, T. V. Industrial Estate
S. K. Ahire Marg
MUMBAI (BOMBAY) 400025

- **The Society for Progress of Science**

SPS
Membresía permanente No.
Pragati Prakashan
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MEERUT 250001

- **Indian Adult Education Association**

IAEA

Membresía permanente No.

Shafiq Memorial

17 B, Indraprastha Estate

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- **Regional Science Association**

RSA

Membresía permanente No. 380

CK-134, Sector-II

Salt Lake City

KOLKATA (CALCUTTA) 700091

- **All India Association for Educational Research** *AIAR*

Membresía permanente No.

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BHUBANESWAR 751015

- **Indian Library Association**

ILA

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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.

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CHENNAI (MADRAS) 600034

- **The Muslim Association for the Advancement of Science** *MAAS*

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44, Ahmad Nagar, Dodhpur
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- **Indian Association of Muslim Social Scientists *IAMSS***

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162, Jogabai Extension
Jamia Nagar
NEW DELHI 110025

- **Indian Association for Islamic Economics**

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4-1212, Sir Syed Nagar
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