Curriculum Vitae*

Sameen Ahmed Khan, PhD
Assistant Professor
Engineering Department
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PERSONAL DATA

Full Name:	**Mr. Sameen Ahmed KHAN**	
Place of Birth:	New Delhi, INDIA	
Nationality:	INDIAN	
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Native Address:	Flat No. 101, Zed Enclave	Phone: +91-40-23568356
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CURRENT POSITION: *Assistant Professor*
Engineering Department
Salalah College of Technology (**SCOT**)
Post Box No. 608, Postal Code: 211
Salalah
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PREVIOUS POSITION: *Assistant Professor* and *Assistant Head*,
Department of Mathematics & Applied Sciences **DOMAS**
Middle East College of Information Technology (**MECIT**)
Technowledge Corridor
Knowledge Oasis Muscat (**KOM**)
Muscat
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*Updated on Friday the 09 October 2009

RESEARCH POSITIONS: **CONACYT-UNAM** Post-Doctoral Fellow,
(with Professor Kurt Bernardo WOLF)
Centro de Ciencias Físicas
Universidad Nacional Autónoma de México (**UNAM**)
Apartado Postal 48-3,
Cuernavaca, Morelos, **MÉXICO**
(15 October 2001 - 13 October 2002)

INFN Post-Doctoral Fellow,
(with Professor Modesto PUSTERLA)
Dipartimento di Fisica Galileo Galilei, Università di Padova
Istituto Nazionale di Fisica Nucleare (**INFN**)
Sezione di Padua/Padova, **ITALY**
(27 October 1997 to 26 October 1999)

Junior Research Fellow (JRF)
The Institute of Mathematical Sciences, (**IMSc/Matscience**),
Chennai (Madras), **INDIA**,
(August 1991 to July 1997).

CAREER OBJECTIVE:
Faculty Member in Departments of Physics or Mathematics in Universities, Institutes of Technology or Engineering Colleges, with teaching and research in Physics OR/AND Mathematics.

TEACHING EXPERIENCE

- **Full-time Lecturer**:
  Salalah College of Technology, SCOT, May-2006 to Present.
  Middle East College of Information Technology, MECIT, September 2003 to May 2006.
- **Teaching**:
  Two-Semester Sequence of Physics for Engineering;
  The Three-Semester Sequence of Engineering Mathematics (Foundation Mathematics, College Mathematics, Calculus with Numerical Methods and Advanced Calculus) and
  The Two-Semester Sequence of Physics (Physics, Engineering Mechanics and Engineering Physics).

OTHER ACTIVITIES

- Drafted the syllabus for the new BS Programme.
- Set up the Department Homepage on the College Intranet, which contains the in-house prepared *Lecture Notes* and *Question Banks*, meeting most of the requirements of all the courses offered by the department.
- **Mathematics Olympiad**
  I was part of the three-member team, which jointly conducted the *first* Mathematics Olympiad in the College, on Wednesday the 26th May 2004. The other two members of the team were my Colleagues from the Department, Ms. Lavanya Venkatesan and Ms. Usha Ramanathan. The second Olympiad was conducted on Tuesday the 21 March 2006. These events are now evolving into a National Olympiad with the first *Intercollegiate Mathematics Olympiad* held on Sunday the 07 May 2006, during the Intercollegiate Meet, **QUEST** (6-8 May 2006, http://www.mecit-quest.com/).
- **Served on several College Committees**:
  Disciplinary Committee, *Journal Committee*, *Library Committee*, *Web-Site Committee*, *Prizes and Awards Committee*, *Accreditation Steering Committee*, *Time Table Committee*, *Examination Committee*, *E-Learning and Library Committee*, *Moderation Committee*, *Staff Development Committee*, *Staff Research and Consultancy*, *Curriculum Review & Development Committee*, *Academic Journal Committee* and *Staff Handbook Committee*.

EDUCATION:

B.Sc. Honours (Physics)	1988, Osmania University, Hyderabad
M.Sc. (Physics)	1990, Indian Institute of Technology (IIT), Kanpur
Ph.D	1997, The Institute of Mathematical Sciences, Chennai (Madras)
Title of the Thesis	Quantum theory of charged-particle beam optics
Description of Ph.D research	Development of quantum mechanical treatment for the study of transport of charged-particle beams through electromagnetic systems
Thesis Supervisor:	Prof. Ramaswamy JAGANNATHAN

Course Work: The Ph.D programme consisted of regular course work over three semesters in Classical Mechanics, Quantum Mechanics, Electromagnetic Theory, Mathematical Physics, Differential Geometry, Group theory, Statistical & Thermal Physics Quantum Field Theory, Quantum Optics and Particle Physics.

Skills:

Spoken and Written English,	Proficient; used as the medium of instruction since kindergarten
Computers:	Familiar with Fortran, LaTeX, MS WORD and Web-designing.

MAIN FIELDS OF RESEARCH: Physics of Beams: Particles & Photons
In particular, Applications of the classical and quantum theory of beam transport to various situations such as Accelerator Optics, Electron Microscopy, *etc.*
Helmholtz Optics and Maxwell Optics. A unified treatment of light beam optics and polarization.

AWARDS & HONOURS:

- **Mathematics Olympiads**:
  Winner of the State Level Mathematics Olympiads at:
  - Junior Level (1983),
  - Senior Level (1985) and
  - Degree (Undergraduate) Level (1986 to 1988).

  (Conducted by **APAMT**: Andhra Pradesh Association of Mathematics Teachers).

- **Young Physicists Colloquium**:
  Invited Lecture at the Young Physicists Colloquium,
  Kolkata (Calcutta), 22-23 August 1996,
  Beam optics of the Dirac particle,
  The Abstract Appeared in: *Physics Teacher*, Vol. **88**, No. 2 & 3, pp. 67, (April-September 1996).
  (Organized by **IPS**: The Indian Physical Society).

- **Biographical Listings**:
  - **Who's Who Online**,
    http://www.whoswho-online.com/whoshome.html, (March 1998).
  - **Asian/American Who's Who**, **Vol. II**,
    (Rifacimento International, New Delhi, India), pp. 367 (2002).
  - **Asia/Pacific Who's Who**, **Vol. IV**,
    (Rifacimento International, New Delhi, India), pp. ??? (2002).
  - **Reference Asia: Asias Who's Who of Men & Women of Achievement**,
    (Rifacimento International, New Delhi, India), pp. ??? (2003).
  - **Asian/American Who's Who, 2005**, **Vol. IV**,
    (Rifacimento International, New Delhi, India), pp. ??? (2005).
  - **Eminent Personalities of the World**, **Vol. I**,
    (World Biographical Research Foundation, Shri Vaishnavi Publishing, Nagpur, India), pp. ??? (2005) (*in press*).
  - **Distinguished & Admirable Achievers-2005**,
    (South-Asia (Intl.) Pub. Co., Delhi, India). pp. ??? (*in press*).

PRESENT RESEARCH: A Summary

(For details see the PUBLICATIONS listed below)

Quantum theory of charged-particle beam dynamics is being developed essentially using an algebraic approach. On the basis of this theory, optics of the transport of nonrelativistic and relativistic charged-particle beams through electromagnetic systems (of importance for charged particle beam devices, like electron microscopy, microelectron-beam lithography, etc., and accelerator design) is being analyzed systematically. The machinery of Lie algebraic methods is used primarily and this facilitates an easy passage from the quantum theory to the traditional classical theory (geometrical optics). The results include the modifications of the paraxial properties and aberration coefficients, with $\hbar$-dependent contributions, for the various optical elements, like the magnetic round lenses, quadrupoles, etc., using the Schrödinger (nonrelativistic), Klein-Gordon and Dirac equations. For charged spin-$\frac{1}{2}$ particles, the Dirac equation leads to spinor contributions to the beam dynamics. We do hope that these quantum corrections, albeit small, would be of some practical significance in certain situations; it should, however, be emphasized that, in any case, it is certainly satisfying to understand the working of the traditional classical theory as an approximation of a proper quantum theory since after all any physical system is quantum mechanical at the fundamental level. The application of the spinor beam optical formalism has been shown to lead to a fully quantum mechanical understanding of the dynamics of a spin-$\frac{1}{2}$ particle with anomalous magnetic moment, including the spin evolution, at the level of single-particle dynamics. The general theory, developed for any magnetic optical element with straight axis, describes the the quantum mechanics of the orbital dynamics, the Stern-Gerlach kicks and the Thomas-Bargmann-Michel-Telegdi (Thomas-BMT) spin evolution.

The application of the Wigner phase-space distribution for studying the quantum mechanics of charged particle beam transport through electromagnetic optical systems provides a natural link between the classical and the quantum descriptions. In this context, the relation between the transformation of the Wigner function of a charged particle optical system, corresponding to the associated scalar wave function, and the transformation of the classical phase-space of the system has been studied.

In the paraxial régime of 3-dim optics, two evolution Hamiltonians are equivalent when one can be transformed to the other modulo scale by similarity through an optical system. To determine the equivalence sets of paraxial optical Hamiltonians one requires the orbit analysis of the algebra $\mathsf{sp}(4, \Re)$ of 4×4 real Hamiltonian matrices. Our strategy uses instead the isomorphic algebra $\mathsf{so}(3, 2)$ of 5×5 matrices with metric $(+1, +1, +1, -1, -1)$ to find 4 orbit regions (strata), 6 isolated orbits at their boundaries, and 6 degenerate orbits at their common point. We thus resolve the degeneracies of the eigenvalue classification.

RESEARCH PLANS

Portions of my work are concerned with the applications of the above formalism and related ideas to various problems such as developing a complete quantum mechanical treatment of high energy polarized beams of Dirac particles (electrons, protons, $\cdots$), including polarization, radiation effects etc., studying the quantum mechanics of beam optical aberrations relevant for electron microscopy (from low voltage to high voltage regions) and microelectron-beam device technology, $\cdots$, etc.

Using the analogy of the Helmholtz equation with the Klein-Gordon equation and the Pauli-Villars approach, a formalism utilizing the powerful techniques of quantum mechanics has been developed for scalar optics including aberrations. This provides an alternative to the traditional *square-root* approach and gives rise to wavelength-dependent contributions modifying the aberration coefficients.

Starting with the Dirac-like form of the Maxwell equations we build a formalism which provides a **unified treatment of beam optics and polarization**. The traditional results (including aberrations) of scalar optics are modified by the wavelength-dependent contributions. Some of the well-known results in polarization studies are realized as the leading-order limit of a more general framework of our formalism.

We are also studying the **Beam Halo Problem** and building a diffraction-based model for the beam losses. In the proposed model we use the machinery of the *Quantum-like* approaches. We are also trying to analyze the bulk characteristics of beams using the powerful techniques of **Statistical Mechanics**.

Expected Outcome of the Proposed Research Plan

Any physical system is quantum mechanical at the fundamental level. So, the proposed research would lead, first of all, to a better understanding of the quantum physics of beam dynamics. Besides this, of course, the results should lead to some insight into the solutions of some of the practical problems of beam dynamics; in the polarization analysis, for example. One immediate result shall be the generalization of the 'bean-optical' form of the Thomas-BMT equation to *all* orders. In our earlier paper the leading order approximation leads to the paraxial beam-optical form of the Thomas-BMT equation.

The preliminary results of the proposed halo model are encouraging and further work is in progress.

PATENTS

Quadricmeter is the instrument devised to identify (distinguish) and measure the various parameters (axis, foci, latera recta, directrix, etc.,) completely characterizing the important class of surfaces known as the quadratic surfaces. Quadratic surfaces (also known as quadrics) include a wide range of commonly encountered surfaces including, cone, cylinder, ellipsoid, elliptic cone, elliptic cylinder, elliptic hyperboloid, elliptic paraboloid, hyperbolic cylinder, hyperbolic paraboloid, paraboloid, sphere, and spheroid. Quadricmeter is a generalized form of the conventional spherometer and the lesser known cylindrometer (also known as the Cylindro-Spherometer). With a conventional spherometer it was possible only to measure the radii of spherical surfaces. Cylindrometer can measure the radii of curvature of a cylindrical surface in addition to the spherical surface. In both the spherometer and the cylindrometer one assumes the surface to be either spherical or cylindrical respectively. In the case of the quadricmeter, there are no such assumptions.

- Sameen Ahmed Khan,
  Quadricmeter,
  Official Journal of the Patent Office, Issue No. **43/2008**, Part-I, pp. 25296 (24 October 2008).
  Application No.: **2126/MUM/2008 A**, International Classification: **B69G1/36**,
  Controller General of Patents Designs and Trade Marks, Government of India.

  `http://ipindia.nic.in/ipr/patent/journal_archieve/journal_2008/patent_journal_2008.htm`

  `http://ipindia.nic.in/ipr/patent/journal_archieve/journal_2008/pat_arch_102008/official_journal`

  `http://www.patentoffice.nic.in/`, `http://www.ipindia.nic.in/`

  (*patent in process*, http://www.geocities.com/rohelakhan/quadricmeter.html).

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PUBLICATIONS

Contributions to International Reports:

1. $\cdots$, A. Sameen KHAN, $\cdots$, (*one of the 300+ Contributors, from 73 Institutions*),
Particle Physics Experiments at JLC,
ACFA Linear Collider Working Group Report,
KEK Report 2001-11 (August 2001).
JLC: Electron-Positron Linear Collider Project.
E-Print: http://arXiv.org/abs/hep-ph/0109166/.

2. $\cdots$, Sameen Ahmed KHAN, $\cdots$, (*one of the 500+ Contributors, from 121 Institutions*),
GLC Project Linear Collider for TeV Physics,
KEK Report 2003-7 (September 2003).
GLC: Global Linear Collider.

3. $\cdots$, Sameen Ahmed KHAN, $\cdots$, (*one of the 250+ Contributors, from 79 Institutions*),
GLD Detector Outline Document (**GLD DOD**),
GLD: A Large Detector Concept study for International Linear Collider for TeV Physics
Report of the
GLD Concept Study Group,
World Wide Study of Physics and Detectors for future Linear e^+e^- Colliders, (March 2006).
GLD: Gaseous tracker based Large Detector.
E-Print: http://arXiv.org/abs/physics/0607154/.

4. $\cdots$, Sameen Ahmed KHAN, $\cdots$, (*one of the 500+ Contributors, from 325 Institutions*),
International Linear Collider Reference Design Report, (*Four Volumes*)
ILC Global Design Report and World Wide Study,
(August 2007).
ILC: International Linear Collider.
E-Print: http://arxiv.org/abs/0712.1950/.

A. Review Article

1. R. Jagannathan and S. A. Khan,
Quantum theory of the optics of charged particles,
Invited article in:
Advances in Imaging and Electron Physics, *Editors*: P. W. Hawkes, B. Kazan and T. Mulvey,
(Academic Press, San Diego, 1996) **Vol. 97**, pp. 257-358 (1996).
(ISBN-10: 0120147394 and ISBN-13: 978-0120147397).

2. Sameen Ahmed Khan,
Wavelength-Dependent Effects in Light Optics,
in *New Topics in Quantum Physics Research*,
Editors: Volodymyr Krasnoholovets and Frank Columbus,
(Nova Science Publishers, New York, 2006, http://www.novapublishers.com/).
pp. 163-204 (30 December 2006).
(ISBN-10: 1600210287 and ISBN-13: 978-1600210280).

3. Sameen Ahmed Khan,
The Foldy-Wouthuysen Transformation Technique in Optics,
Invited article in:
Advances in Imaging and Electron Physics, *Editor*: Peter W. Hawkes,
(Elsevier, 2008) **Vol. 152**, pp. 49-78 (August 2008).
(ISBN-10: 0123742196 and ISBN-13: 978-0-12-374219-3).

B. Refereed Publications

1. S. A. Khan and R. Jagannathan,
   On the quantum mechanics of charged particle beam transport through magnetic lenses,
   Physical Review **E 51**, 2510-2515 (March 1995).

2. M. Conte, R. Jagannathan, S. A. Khan and M. Pusterla,
   Beam optics of the Dirac particle with anomalous magnetic moment,
   Particle Accelerators **56**, 99-126 (1996).

3. S. A. Khan and M. Pusterla,
   Quantum-like approach to the transversal and longitudinal beam dynamics. The halo problem,
   European Physical Journal **A 7** No. 4, 583-587 (2000).

4. Sameen Ahmed Khan and Modesto Pusterla,
   Quantum approach to the halo formation in high current beams,
   Nuclear Instruments and Methods in Physics Research (NIMS) **A 464**, Issue 1-3, 461-464 (May 2001).
   Refereed Proceedings of the *13th International Symposium on Heavy Ion Inertial Fusion* (**HIF2000**) (13-17 March 2000, San Diego, USA).

5. Sameen Ahmed Khan and Kurt Bernardo Wolf,
   Hamiltonian orbit structure of the set of paraxial optical systems,
   Journal of the Optical Society of America **A 19** (12), 2436-2444 (December 2002).

6. Sameen Ahmed Khan,
   Wavelength-dependent modifications in Helmholtz Optics,
   International Journal of Theoretical Physics, **44**(1), 95-125 (January 2005).
   (Kluwer Academic Publishers, https://www.editorialmanager.com/ijtp/).

7. Sameen Ahmed Khan,
   An Exact Matrix Representation of Maxwells Equations,
   Physica Scripta, **71**(5) 440-442 (2005).
   (http://www.physica.org/).

8. Sameen Ahmed Khan,
   The Foldy-Wouthuysen Transformation Technique in Optics,
   Optik-International Journal for Light and Electron Optics, **117**, Issue 10, pp. 481-488 (October 2006).
   (http://www.elsevier-deutschland.de/ijleo/).

9. Sameen Ahmed Khan,
   Maxwell Optics of Quasiparaxial Beams,
   Optik-International Journal for Light and Electron Optics, **120**, Issue ??, pp. ???-??? (??? 2009).
   (http://www.elsevier-deutschland.de/ijleo/).
   (*in press*, Digital Object Identifier, http://dx.doi.org/10.1016/j.ijleo.2008.07.027).

10. Sameen Ahmed Khan and Modesto Pusterla,
    On the form of Lorentz-Stern-Gerlach force,
    10 pages, (*communicated*).

11. Sameen Ahmed Khan, Ramaswamy Jagannathan and Rajiah Simon,
    Foldy-Wouthuysen transformation and a quasiparaxial approximation scheme for the scalar wave theory of light beams,
    14 pages, (*communicated*).

12. Sameen Ahmed Khan,
    Wavelength-dependent modifications in Maxwell Optics,
    59 pages, (*communicated*).

The corrections to the traditional descriptions rigorously derived in the above articles have a significant bearing on the celebrated Scherzer Theorem in the wavelength-dependent regime in electron microscopy and the algebraically equivalent system of fiber optics. An application shall be made for a patent in the near future!

C. E-Prints[†]
http://arXiv.org/

1. Sameen Ahmed Khan,
   An alternate way to obtain the aberration expansion in Helmholtz Optics,
   40 pages, *E-Print*: http://arXiv.org/abs/physics/0210001/.
2. Sameen Ahmed Khan,
   Maxwell Optics: I. An exact matrix representation of the Maxwell equations in a medium,
   10 pages, *E-Print*: http://arXiv.org/abs/physics/0205083/.
3. Sameen Ahmed Khan,
   Maxwell Optics: II. An Exact Formalism,
   23 pages, *E-Print*: http://arXiv.org/abs/physics/0205084/.
4. Sameen Ahmed Khan,
   Maxwell Optics: III. Applications,
   13 pages, *E-Print*: http://arXiv.org/abs/physics/0205085/.
5. Sameen Ahmed Khan,
   Wavelength-Dependent Effects in Maxwell Optics,
   58 pages, *E-Print*: http://arXiv.org/abs/physics/0210027/.

D. In Proceedings & Preprints

1. S. A. Khan and R. Jagannathan,
   Theory of relativistic electron beam transport based on the Dirac equation,
   in: *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 (1996).
2. S. A. Khan and R. Jagannathan,
   Quantum mechanics of charged particle beam optics: An operator approach,
   Preprint: IMSc-94/11 Presented at the **JSPS-KEK** International Spring School on High Energy Ion Beams — Novel Beam Techniques and their Applications, Japan, 17-29 March 1994.
3. R. Jagannathan and S. A. Khan,
   Wigner functions in charged particle optics,
   in: Selected Topics in Mathematical Physics — Professor R. Vasudevan Memorial Volume,
   Editors: R. Sridhar, K. Srinivasa Rao, and V. Lakshminarayanan
   (Allied Publishers, Delhi, 1995), pp. 308-321 (1995).
4. S. A. Khan,
   Transport of Dirac-particle beams through magnetic quadrupoles,
   `Preprint: IMSc/96/33` (The Institute of Mathematical Sciences, Chennai (Madras), Dec. 1996).
5. R. Jagannathan and S. A. Khan,
   Quantum mechanics of accelerator optics,
   ICFA Beam Dynamics Newsletter, **13**, pp. 21-27 (April 1997).
   (**ICFA**: International Committee for Future Accelerators).
6. S. A. Khan,
   Quantum theory of magnetic quadrupole lenses for spin-$\frac{1}{2}$ particles,
   in: *Proceedings of the 15th Advanced ICFA Beam Dynamics Workshop on Quantum Aspects of Beam Physics*, (04-09 January 1998, Monterey, California USA),
   Editor: Pisin Chen, (World Scientific, Singapore, 1999), pp. 682-694 (1999).

[†]These E-Prints are being rewritten as long *Reports* or/and *Review Articles*

7. Sameen A. Khan,
Quantum aspects of accelerator optics,
in: Proceedings of the *1999 Particle Accelerator Conference* (**PAC99**),
(29 March - 02 April 1999, New York City, NY), *Editors*: A. Luccio and W. MacKay,
(IEEE Catalogue Number: 99CH36366) pp. 2817-2819 (1999).
8. Sameen A. Khan and Modesto Pusterla,
Quantum mechanical aspects of the halo puzzle,
in: Proceedings of the *1999 Particle Accelerator Conference* (**PAC99**)
(29 March - 02 April 1999, New York City, NY), *Editors*: A. Luccio and W. MacKay,
(IEEE Catalogue Number: 99CH36366) pp. 3280-3281 (1999).
9. Sameen A. Khan and Modesto Pusterla,
Quantum-like approaches to the beam halo problem,
in: Proceedings of the *6th International Conference on Squeezed States and Uncertainty Relations* **ICSSUR'99**, (24-29 May 1999, Napoli, Italy)
Editors: D Han, Y S Kim, and S Solimeno,
(NASA Conference Publication Series, 2000-209899) pp. 438-441 (July 2000).
10. S. A. Khan,
Quantum mechanical formalism of particle beam optics,
in: *Proceedings of the 18th Advanced ICFA Beam Dynamics Workshop on Quantum Aspects of Beam Physics* (15-20 October 2000, Capri, Italy), *Editor*: Pisin Chen,
(World Scientific, Singapore, May 2002), pp. 517-526 (2002).
11. Sameen Ahmed Khan,
Analogies between light optics and charged-particle optics,
ICFA Beam Dynamics Newsletter, **27**, pp. 42-48 (June 2002).
Cited in:
The NET Advance of Physics (Review Articles and Tutorials in an Encyclopaedic Format)
http://web.mit.edu/redingtn/www/netadv/Xoptics.html

E. Expository Publications

1. Sameen Ahmed Khan,
The World of Synchrotrons,
Resonance Journal of Science Education, **6**(11), pp. 77-84 (November 2001).
(Monthly Publication of the Indian Academy of Sciences (**IAS**), Copublished with Springer);
Larger Version as *E-Print arXiv*: http://arXiv.org/abs/physics/0112086/.
Cited in:
The Net Advance of Physics (Review Articles and Tutorials in an Encyclopaedic Format), at
http://web.mit.edu/redingtn/www/netadv/Xsynchrotr.html

2. Sameen Ahmed Khan,
Introduction to Synchrotron Radiation,
Bulletin of the IAPT, **19**(5), pp. 149-153 (May 2002).
(**IAPT**: Indian Association of Physics Teachers).

3. Sameen Ahmed Khan,
Electron Beams for Radiation,
Kiran, **13**(3), 40-42 (July 2002).
(**Kiran**: the Bulletin of the Indian Laser Association).

4. Azher Majid Siddiqui and Sameen Ahmed Khan,
Ion Beam Channeling and Accelerator Programmes in India,
MRSI Newsletter, Vol. **B 02**, Number 4, pp. 3-5 (October 2002).
(**MRSI**: Materials Research Society of India).

5. Fathiya Khamis Al Rawahi, Sameen Ahmed Khan and Abdul Huq,
Microsoft Excel in the Mathematics Classroom: A Case Study,
in *Proceedings* of **The Second Annual Conference for Middle East Teachers of Mathematics, Science and Computing** (**METSMaC 2006**),
The Petroleum Institute, Abu Dhabi, United Arab Emirates, 14-16 March 2006.
Editors: Sean M Stewart, Janet E. Olearski and Douglas Thompson, pp. 131-134 (2006).

6. Sameen Ahmed Khan,
   Microsoft Excel in the Physics Classroom,
   in *Proceedings* of **The Third Annual Conference for Middle East Teachers of Mathematics, Science and Computing** (**METSMaC 2007**),
   The Petroleum Institute, Abu Dhabi, United Arab Emirates, 17-19 March 2007.
   Editors: Seán M. Stewart, Janet E. Olearski, Peter Rodgers, Douglas Thompson and Emer A. Hayes, pp. 171-175 (2007).
7. Sameen Ahmed Khan,
   Data Analysis Using Microsoft Excel in the Physics Laboratory,
   Bulletin of the IAPT, **24**(6), pp. 184-186 (June 2007).
   (**IAPT**: Indian Association of Physics Teachers).
8. Sameen Ahmed Khan,
   Cylindro-Spherometer,
   Bulletin of the IAPT, **26**(1), pp. 4-6 (January 2009).
   (**IAPT**: Indian Association of Physics Teachers).
9. Sameen Ahmed Khan,
   Spherometer and Cylindrometer, (*communicated*).
   The article discusses the traditional spherometer and some variants such as the ring spherometer and the cylindrometer (also known as Cylindro-Spherometer), fabricated by the author.
10. Sameen Ahmed Khan,
    Quadratic Surfaces.
    (*in preparation*).
11. Sameen Ahmed Khan,
    Coordinate Geometric Approach to.
    (*in preparation*).
12. Sameen Ahmed Khan,
    Doing Numerical Calculus using Microsoft EXCEL.
    (*in preparation*).
13. Sameen Ahmed Khan,
    Numerical Techniques using Microsoft EXCEL.
    (*in preparation*).
14. Azher Majid Siddiqui and Sameen Ahmed Khan,
    Introduction to Ion Beam Channeling,
    (*in preparation*).
15. Azher Majid Siddiqui and Sameen Ahmed Khan,
    Accelerator-Based Techniques and Applications in Research and Industry,
    (*in preparation*).

F. Articles in Preparation

- Sameen Ahmed Khan,
  Quantum Methodologies in Light Beam Optics.
- Sameen Ahmed Khan,
  Generalized Spherometer.
- Sameen Ahmed Khan,
  On the Linearization of Wave Equations.
- Sameen Ahmed Khan,
  Why is the Foldy-Wouthuysen transform so little known in optics?.
- R. Jagannathan *et al*,
  Maxwell Optics: IV. Polarization.
- Sameen Ahmed Khan and Kurt Bernardo Wolf,
  Equivalent and nonequivalent astigmatic Hamiltonians.

- R. Jagannathan, S. A. Khan and R. Simon,
On the Maxwell optics of quasiparaxial beams.
- M. Conte, R. Jagannathan, S. A. Khan and M. Pusterla,
A quantum mechanical formalism for studying the transport of Dirac-particle beams through magnetic optical elements in accelerators.
- S. A. Khan,
Anomalous moments $\cdots$ **Thomas-BMT** $\cdots$.
- S. A. Khan and R. Jagannathan,
Quantum theory of aberrations in charged-particle beam optics.
- Sameen A. Khan and Modesto Pusterla,
A diffraction model for the beam halo problem.
- And Others...

REFERENCES:

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Optics & Photonics News (OPN), **18** (10), pp. 22-23 (October 2007).
The Prizes are awarded every year by the King Faisal Foundation (**KFF**), Saudi Arabia.

96. Sameen Ahmed Khan,
Synchrotron X-Ray ki Tarz ki Nahayat Taraquiyaftah Machine: Mashraqui-wasta ke liye Germany ka Atyah,
(Article in Urdu, **Synchrotron an Advanced X-Ray Source: Germany's Gifts to the Middle East**),
Zikra Jadeed, **Vol. 4**, No. 43, pp. 27-33 (October 2007).
(Zikra Jadeed is a monthly publication from Delhi, India).
Tarjumani/Translator: Dr. Azher Majid Siddiqui, http://www.geocities.com/azherms/.

97. Sameen Ahmed Khan,
Impact of ICT in various spheres of life,
Digital Oman, Issue 11, pp. 37-38 (Fall 2007).
Supplement to Oman Observer, **Vol. 27, No. 19** (Monday the 03 December 2007).
A quarterly, English-Arabic bilingual publication by Oman Establishment for Press, News, Publication and Advertising (**OEPNPA**) in partnership with the Information Technology Technical Secretariat (**ITTS**) at the Ministry of National Economy and the Public Establishment for Industrial Estates (**PEIE**).

98. Sameen Ahmed Khan,
Regarding the Etiquette of Hajj,
Letter in *Islamic Voice*, **Vol. 21-02** No. 254, pp. ?? (February 2008);
Pakistan Link, pp. ??? (Friday the 04 April 2008). (Published from Irvine, California, USA).

99. Sameen Ahmed Khan,
Review of the Books:
The History of Makkah Mukarramah (**ISBN**: 9960-44-929-7) and
The History of Madinah Munawwarah (**ISBN**: 9960-43-442-7)
by Dr. Muhammad Ilyas Abdul Ghani,
(Al-Rasheed Printers, Madinah Munawwarah, Kingdom of Saudi Arabia).
Islamic Voice, **Vol. 21-02** No. 254, pp. 33 (February 2008);
Radiance Viewsweekly, **Vol. XLV**, No. 29, pp. ?? (February 2008).
Long Book Review:
Renaissance, **Vol. 18**, No. 09, pp. ??-?? (September 2008).

100. Sameen Ahmed Khan,
What is E-Learning?,
Youth Observer, pp. 7 (April 2008 - Rabee Al Awwal 1429 AH).
Supplement to Oman Observer, **Vol. 27, No. 144** (Sunday the 06 April 2008).
(**OEPNPA**: Oman Establishment for Press, News, Publication and Advertising in co-operation with the Ministry of Education).

101. Sameen Ahmed Khan,
Start with Eye Donations,
Letter, in *The Week*, Issue **268**, pp. 2 (23 April 2008).
(The Apex Press and Publishing, Muscat, Sultanate of Oman).

102. Sameen Ahmed Khan,
Report of the First International Conference on Arabs' and Muslims History of Sciences,
(24-27 March 2008, University of Sharjah, Sharjah, United Arab Emirates),
Islamic Voice, **Vol. 21-05**, No. 257, pp. ?? (May 2008);
American Journal of Islamic Social Sciences (**AJISS**), **Vol. 25**, No. 3, pp. 158-160 (Summer 2008).

103. Sameen Ahmed Khan,
Cylindro-Spherometer,
Bulletin of the IAPT, **26**(1), pp. 4-6 (January 2009).
(**IAPT**: Indian Association of Physics Teachers).

104. Sameen Ahmed Khan,
King Faisal International Prize 2009,
Europhysics News **40**(3), pp. 7 (May-June 2009).
(Publication of the *European Physical Society*).

105. Sameen Ahmed Khan,
Awareness is the first step, but shouldn't we have regulation?,
Letter, in *H! Magazine*, **Vol. III**, **Issue 13**, pp. 17 (Friday the 19 June 2009).
(Muscat Press & Publishing House, Muscat, Sultanate of Oman).
This issue is the *Energy Compliant Equipment*.

106. Sameen Ahmed Khan,
Spam is here to stay,
Letter, in *The Week*, Issue **330**, pp. 42 (01 July 2009).
(The Apex Press and Publishing, Muscat, Sultanate of Oman).

107. Sameen Ahmed Khan,
Spherometer and Cylindrometer, (*communicated*).
The article discusses the traditional spherometer and some variants such as the ring spherometer and the cylindrometer (also known as Cylindro-Spherometer), fabricated by the author.

108. Sameen Ahmed Khan,
Need to Create Regional Science Centres in the Developing Countries,
For the *Proceedings* of **Higher Education in Developing Countries: With a Focus on Muslim Contexts**, The Aga Khan University Institute for the Study of Muslim Civilisations, (**AKU-ISMC**), (24-25 February 2005, London, UK).
10 pages (*communicated*).

109. Sameen Ahmed Khan,
E-Learning Challenges and Prospects in the Middle East,
The Online Virtual Conference of the **World Forum on Information Society** (**WFIS**), (31 March - 13 November 2005), *Pre-Cursor* to the **IRFD World Forum 2005**,
14-16 November
Conference on Digital Divide, Global Development and the Information Society,
Organized by **United Nations World Summit on the Information Society**,
Tunis, Tunisia.
(**IRFD**: International Research Foundation for Development).
06 pages (*submitted*).

110. Sameen Ahmed Khan,
Medieval Arab Contributions to Optics;
Medieval Arab Contributions to Physics;
Medieval Arab Contributions to Mathematics.
(*in preparation*).

111. Sameen Ahmed Khan,
Quadratic Surfaces.
(*in preparation*).

112. Sameen Ahmed Khan,
Coordinate Geometric Approach to.
(*in preparation*).

113. Sameen Ahmed Khan,
Doing Numerical Calculus using Microsoft EXCEL.
(*in preparation*).

114. Sameen Ahmed Khan,
Numerical Techniques using Microsoft EXCEL.
(*in preparation*).

In March 2005, I was appointed as the *Regular Correspondent* for the ICFA Beam Dynamics Panel Newsletters, for the regions of Middle East & Africa. ICFA, the International Committee for Future Accelerators, provides a forum to discuss and implement plans for further promoting collaborative accelerator-based science. Its primary purpose is to strengthen collaboration in accelerator-based science, to encourage future projects, and to make recommendations to governments. Further details at:

http://icfa-usa.jlab.org/archive/newsletter.shtml

PARTICIPATION IN CONFERENCES/SEMINARS/COLLOQUIA VISITS TO INSTITUTIONS

1. 07-15 November 1993
The CERN Accelerator School: Physics & Engineering for Particle Accelerators,
Held at: Raja Ramanna Centre for Advanced Technology (**RRCAT**), Indore, India.
2. 25-27 November 1993
3rd National Seminar on Physics and Technology of Particle Accelerators and their Applications PATPAA-93. *Held at*: **IUC-DAEF**, Kolkata (Calcutta) Centre, India,
Poster: **Theory of relativistic electron beam transport based on the Dirac equation**.
3. 17-29 March 1994
JSPS-KEK International Spring School: High Energy Ion Beams—Novel Beam Techniques and their Applications, *Held in Japan at*:
National Laboratory for High Energy Physics (**KEK**)
Institute of Nuclear Study (**INS**)
Institute of Physical and Chemical Research (**RICKEN**)
Talk: **Quantum mechanics of charged particle beam optics: An operator approach**.
4. 23 January - 10 February 1995
SERC School[‡] **on Coherence and Correlations in Modern Optics and Quantum Physics**,
Held at: The Institute of Mathematical Sciences, Chennai (Madras), India
Talk: **Charged Particle Optics — A Wigner function approach**.
5. 10-12 November 1995
61st Annual Meeting of Indian Academy of Science,
Held at: Chennai (Madras), India.
6. 09 March 1996
Workshop on Internet for Educational and Research Organizations,
Held at: The Institute of Mathematical Sciences, Chennai (Madras), India
7. 22-23 August 1996
Young Physicists Colloquium,
Organized by: The Indian Physical Society (**IPS**), Kolkata (Calcutta), India,
Talk: **Beam optics of the Dirac particle**.
8. 10-15 January 1997
International Conference on Dynamical Systems,
Held at: The Indian Institute of Science, Bangalore, India,
Poster: **Transport of Dirac-particle beams through magnetic quadrupoles**.
9. 13-25 January 1997
School on Physics of Beams,
Held at: Raja Ramanna Centre for Advanced Technology (**RRCAT**), Indore, India,
Talk: **Beam optics of the Dirac particle**.
10. 03-21 March 1997
Winter College on Quantum Optics: Novel Radiation Sources,
Held at: The Abdus Salam International Centre for Theoretical Physics (**ICTP**), Trieste, Italy,
Talk: **Quantum mechanical approach to beam physics**.
11. 25-27 March 1997
Dipartimento di Fisica Galileo Galilei
Università di Padova
Istituto Nazionale di Fisica Nucleare (**INFN**),
Sezione di Padova, Padua/Padova, Italy.
12. 19-22 November 1997
Salam Memorial Meeting
Held at: The Abdus Salam International Centre for Theoretical Physics (**ICTP**), Trieste, Italy.

[‡]Actively involved in capacity as the **Member of the Local Organizing Committee** and **Publicity Secretary**. The School Circular appeared in numerous places including, *CERN Courier*, **34**(9), 23-24 (November 1994); and *AAPPS Bulletin*.

13. 09-13 December 1997
Istituto Nazionale di Fisica Nucleare (**INFN**),
Sezione di Naples, Naples, Italy.
Talk-I: **Transport of Dirac particle beams through magnetic quadrupoles**
Talk-II: **Wigner function approach to quantum theory of charged-particle beam optics**.
14. 04-09 January 1998
15th Advanced ICFA Beam Dynamics Workshop on Quantum Aspects of Beam Physics,
Monterey, California, USA,
Talk: **Quantum theory of magnetic quadrupole lenses for spin-$\frac{1}{2}$ particles**.
15. 12-14 January 1998
Center for Beam Physics,
Ernest Orlando Lawrence Berkeley National Laboratory (**LBNL**),
University of California, Berkeley, USA.
Quantum theory of magnetic quadrupole lenses for spin-$\frac{1}{2}$ particles.
16. 19-30 January 1998
US Particle Accelerator School (**USPAS**),
University of Texas at Austin, Austin, USA.
17. 13-15 May 1998
Workshop on Non-Linear Problems in Charged-Particle Beam Transport in Linear and Recirculated Accelerators, Analysis of Transverse and Longitudinal Instabilities,
Italian National Agency for New Technology, Energy and Environment (**ENEA**), Frascati, Italy,
Talk: **Quantum methodology in beam physics**.
18. 28 June - 05 July 1998
Deutsches Elektronen-Synchrotron (**DESY**),
Hamburg, Germany.
Talk: **Quantum theory of accelerator optics**.
19. 09-10 November 1998
Fermi National Accelerator Laboratory (**Fermilab**),
Batavia, Illinois, USA.
Talk: **Quantum theory of charged-particle optics**.
20. 12-13 November 1998
Brookhaven National Laboratory (**BNL**),
Upton, New York, USA.
Talk: **Quantum theory of charged-particle optics**.
21. 20-26 March 1999
Centennial Meeting of the American Physical Society,
Held at: Atlanta, Georgia, USA,
Talk: **Quantum aspects of charged-particle beam optics**.
22. 29 March - 02 April 1999
1999 Particle Accelerator Conference (**PAC99**),
Held at: New York City, USA,
Poster-I: **Quantum aspects of accelerator optics**,
Poster-II: **Quantum mechanical aspects of the halo puzzle**.
23. 24-29 May 1999
6th International Conference on Squeezed States and Uncertainty Relations (**ICSSUR'99**),
Held at: Dipartimento di Scienze Fisiche, Università di Napoli "Federico II", Napoli, Italy,
Poster: **Quantum-like approaches to the beam halo problem**.
24. 15-17 December 1999.
National Laser Symposium (**NLS-1999**),
Held at: School of Physics, University of Hyderabad,
Hyderabad, India.
25. 29 January - 29 February 2000
The Institute of Mathematical Sciences (**IMSc/Matscience**),
Chennai (Madras), India.

26. 15-20 October 2000
18th Advanced ICFA Beam Dynamics Workshop on Quantum Aspects of Beam Physics,
Capri, Italy,
Talk: **Quantum formalism of beam optics**.
27. 21-26 October 2000
Dipartimento di Fisica,
Università di Salerno,
Salerno, Italy.
28. 23 October 2000
Mini Workshop on Quantum Methodologies in Beam Physics,
Held at: Dipartimento di Fisica,
Università di Salerno,
Salerno, Italy,
Talk: **Quantum Aspects of Charged-Particle Beam Optics**.
29. 18-22 December 2000
XIV DAE Symposium on High Energy Physics,
Held at: School of Physics,
University of Hyderabad,
Hyderabad, India.
30. 10-14 December 2001
Mathematical Results in Quantum Mechanics,
Held at: Taxco, **MÉXICO**.
31. 02-06 September 2002
IV International Workshop on Classical and Quantum Integrable Systems,
Held at: Centro de Ciencias Físicas, Universidad Nacional Autónoma de México (**UNAM**), Cuernavaca, Morelos, **MÉXICO**.
32. 23 May - 22 June 2003
Middle East College of Information Technology (**MECIT**),
Technowledge Corridor, Knowledge Oasis Muscat (**KOM**)
Muscat, Sultanate of Oman.
33. 19 May 2004
International Conference in E-Business
E-Business in GCC Challenges and Prospects (EGCC'04)
Majan College (University College)
Muscat, Sultanate of Oman.
Presentation: **E-Learning Challenges in the Middle East**.
34. 23-30 August 2004
The Institute of Mathematical Sciences (**IMSc/Matscience**),
Chennai (Madras), India.
35. 24-25 February 2005
Higher Education in Developing Countries: With a Focus on Muslim Contexts,
The Aga Khan University Institute for the Study of Muslim Civilisations (**AKU-ISMC**), London, UK.
Talk: **Need to Create Regional Science Centres in the Developing Countries**.
36. 31 March - 13 November 2005
The Online Virtual Conference of the **World Forum on Information Society** (**WFIS**),
Pre-Cursor to the **IRFD World Forum 2005**
14-16 November
Conference on Digital Divide, Global Development and the Information Society
Organized by **United Nations World Summit on the Information Society**,
Tunis, Tunisia.
(**IRFD**: International Research Foundation for Development).
Presentation: **E-Learning Challenges and Prospects in the Middle East**.
37. 08-09 May 2005
ICT 2005: The business value of IT
Muscat, Sultanate of Oman.

38. 31 October - 02 November 2005
World Conference on Physics and Sustainable Development (**WCPSD**),
Durban, South Africa.
Presentation: **Role of Physics Institutions in International Collaborations**.
39. 14-15 November 2005
The Second Engineering Students Gathering
College of Engineering
Sultan Qaboos University
Muscat, Sultanate of Oman.
(Participated as a *Referee* for the Project Presentations).
40. 23-24 January 2006
PEIE's Smart Manufacturing Conference,
Muscat, Sultanate of Oman.
(**PEIE:** Public Establishment for Industrial Estates, http://www.peie.om/).
41. 23-25 November 2006
Dipartimento di Fisica Galileo Galilei
Università di Padova
Istituto Nazionale di Fisica Nucleare (**INFN**),
Sezione di Padova, Padua/Padova, Italy.
Collaboration: **The Halo Problem in Accelerator Beams**.
42. 27 November - 01 December 2006
Workshop on Economic Development for Physicists from Developing Countries (**EDPDC**),
Held at: The Abdus Salam International Centre for Theoretical Physics (**ICTP**), Trieste, Italy,
43. 15-18 August 2007
The Institute of Mathematical Sciences (**IMSc/Matscience**),
Chennai (Madras), India.

- 23-28 May 2010 (**SCHEDULED**)
International Particle Accelerator Conference (**IPAC-2010**),
Kyoto, JAPAN.
Poster-I: **Quantum Theory of Accelerator Optics** (**ID: 1668**).
Under the
Main Classification: 05 Beam Dynamics and Electromagnetic Fields.
Sub Classification: D01 - Beam Optics - Lattices, Correction Schemes, Transport.
Poster-II: **Quantum Methodologies in Light Beam Optics** (**ID: 1669**).
Under the
Main Classification: 05 Beam Dynamics and Electromagnetic Fields.
Sub Classification: D01 - Beam Optics - Lattice, Correction Schemes, Transport.
- July-August 2010 (**SCHEDULED**)
The Institute of Mathematical Sciences (**IMSc/Matscience**),
Chennai (Madras), India.
- 28 March - 01 April 2011 (**SCHEDULED**)
Particle Accelerator Conference (**PAC-2011**),
New York, USA.
- 01-06 September 2011 (**SCHEDULED**)
International Particle Accelerator Conference (**IPAC-2011**),
Valencia, SPAIN.
- 2012 (**SCHEDULED**)
International Particle Accelerator Conference (**IPAC-2012**),
USA.
- 2013 (**SCHEDULED**)
International Particle Accelerator Conference (**IPAC-2013**),
Shanghai, CHINA (**Probable Location**).

ANNUAL MEMBERSHIPS

- **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**)
- **Institute of Physics** (**IOP**), UK.
- **International Association of Mathematical Physics** (**IAMP**)
- **International Radiation Physics Society** (**IRPS**)
- **Optical Society of America** (**OSA**)

LIFE MEMBERSHIPS OF ACADEMIC ORGANIZATIONS

- **Indian Physical Society**
  IPS
  Life Membership No. IPS/LM/95
  Department of Material Science
  Indian Association for Cultivation of Science
  Jadavpur
  KOLKATA (CALCUTTA) 700032
- **Particle Accelerator Society of India**
  PASI
  Life Membership No.
  Accelerator Office
  Raja Ramanna Centre for Advanced Technology (**RRCAT**)
  Post: RRCAT Rajendranagar
  INDORE 452013
- **Optical Society of India**
  OSI
  Life Membership No. L 225
  Department of Applied Physics
  University of Calcutta
  92, Acharya Prafulla Chandra Road
  KOLKATA (CALCUTTA) 700009
- **Materials Research Society of India**
  MRSI
  Life Membership No. L 1069
  C/O Composites Group
  Defence Metallurgical Research Laboratory
  P.O Kanchanbagh
  HYDERABAD 500258
- **Indian Association of Physics Teachers**
  IAPT
  Life Membership No. 5304-L2529
  L-117/302, Naveen Nagar
  KANPUR 208025
- **Astronomical Society of India**
  ASI
  Life Membership No. L/959
  Department of Astronomy
  Osmania University
  HYDERABAD 500007
- **Indian Physics Association**
  IPA
  Life Membership No. MAS/LM/10896
  Tata Institute of Fundamental Research
  Homi Bhabha Road
  Colaba
  MUMBAI (BOMBAY) 400005
- **Power Beam Society of India**
  PSI
  Life Membership No.
  Electron Beam Centre
  Kharghar
  Sector 7, CBD
  NAVI MUMBAI (BOMBAY) 400614
- **Indian Laser Association**
  ILA
  Life Membership No. LM/348
  Laser Research & Development Block-B
  Raja Ramanna Centre for Advanced Technology (**RRCAT**)
  Post: RRCAT Rajendranagar
  INDORE 452013
- **Indian Society of Atomic and Molecular Physics** *ISAMP*
  Life Membership No. 1181
  Physical Research Laboratory (**PRL**)
  Navrangpura
  AHMEDABAD 380009
- **Indian Society for Technical Education**
  ISTE
  Life Membership No. LM 24901
  Indian Institute of Technology Campus
  Hauz Khas
  NEW DELHI 110016
- **Indian Association for General Relativity and Gravitation** *IAGRG*
  Life Membership No.
  Inter-University Centre for Astronomy and Astrophysics
  Post Bag 4, Ganeshkhind
  PUNE 411007

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

- **Magnetics Society of India**
  MSI
  `Life Membership No. LM-211`
  C/O Composites Group
  Defence Metallurgical Research Laboratory
  P.O Kanchanbagh
  HYDERABAD 500258

- **Semiconductor Society (India)**
  SSI
  `Life Membership No.`
  Solid State Physics Laboratory
  Lucknow Road
  DELHI 110054

- **Indian Society for Mass Spectrometry**
  ISMAS
  `Life Membership No. LM-629`
  Fuel Chemistry Division
  Bhabha Atomic Research Centre (**BARC**)
  MUMBAI (BOMBAY) 400085

- **Indian Nuclear Society**
  INS
  `Life Membership No. LM-6658`
  Project Square, Anushaktinagar
  MUMBAI (BOMBAY) 400094

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

- **Solar Energy Society of India**
  SESI
  `Life Membership No. 0949/LM/2000`
  Tata Energy Research Institute
  Darbari Seth Block, Habitat Place, Lodhi Road
  NEW DELHI 110003

- **Plasma Science Society of India**
  PSSI
  `Life Membership No. L-415`
  Institute for Plasma Research
  Bhat
  GANDHINAGAR 382424

- **Powder Metallurgy Association of India**
  PMAI
  `Life Membership No. LM-486`
  Hoganas India Ltd.
  4, North Road, Koregaon
  Park
  PUNE 411007

- **Indian Society for Surface Science and Technology** *ISSST*
  `Life Membership No. K-31`
  Department of Chemistry
  Jadavpur University
  KOLKATA (CALCUTTA) 700032

- **Indian Vacuum Society**
  IVS
  `Life Membership No. LM 709`
  Technical Physics & Prototype Engineering Division
  Bhabha Atomic Research Centre (**BARC**)
  MUMBAI (BOMBAY) 400085

- **Association of Medical Physicists of India**
  AMPI
  `Life Membership No. LM-1685`
  Radiological Physics & Advisory Division (RPAD)
  Bhabha Atomic Research Centre (**BARC**)
  CT&CRS Building, Anushaktinagar
  MUMBAI (BOMBAY) 400094

- **Indian Academy of Mathematics** $\mathcal{IAM}$
  `Life Membership No. LM-128`
  15, Kaushaliyapuri
  Chitawad Road
  INDORE 452001
- **Ramanujan Mathematical Society** $\mathcal{RMS}$
  `Life Membership No.`
  Ramanujan Institute for Advanced Studies in Mathematics
  University of Madras
  CHENNAI (MADRAS) 600005
- **Indian Society for History of Mathematics** $\mathcal{ISHM}$
  `Life Membership No. L-132`
  Department of Mathematics
  Ramjas College
  University of Delhi
  NEW DELHI 110007
- **Indian Statistical Institute** $\mathcal{ISI}$
  `Life Membership No. L/7827`
  203, Barrackpore Trunk Road
  KOLKATA (CALCUTTA) 700035
- **Operational Research Society of India** $\mathcal{ORSI}$
  `Senior Life Membership`
  `No. 0476/S/00/MSL`
  39, Mahanirvan Road
  KOLKATA (CALCUTTA) 700029
- **Cryptology Research Society of India** $\mathcal{CRSI}$
  `Life Membership No. L/154`
  Applied Statistics Unit
  Indian Statistical Institute
  203, Barrackpore Trunk Road
  KOLKATA (CALCUTTA) 700108
- **Association of Mathematics Teachers of India** $\mathcal{AMTI}$
  `Life Membership No. L01012`
  B-19, Vijay Avenue, Old No. 37, New No. 85
  Venkatatarangam Street, Triplicane
  CHENNAI (MADRAS) 600005
- **Society for Special Functions and their Applications** $\mathcal{SSFA}$
  `Life Membership No. 321`
  Department of Mathematics
  Aligarh Muslim University
  ALIGARH 202002
- **Indian Society for Mathematical Modeling and Computer Simulation** $\mathcal{ISMMCS}$
  `Life Membership No.`
  Department of Mathematics
  Indian Institute of Technology (**IIT**) Kanpur
  KANPUR 208016
- **Indian Statistical Association** $\mathcal{ISA}$
  `Life Membership No. 197`
  Department of Statistics, University of Poona
  PUNE 411007
- **Computer Society of India** $\mathcal{CSI}$
  `Life Membership No. 00059965`
  122, T. V. Industrial Estate
  S. K. Ahire Marg
  MUMBAI (BOMBAY) 400025
- **Indian Association for Medical Informatics** $\mathcal{IAMI}$
  `Life Membership No. PL04353`
  Department of Surgery, GMCH
  1155, Sector-32-B
  CHANDIGARH

- **Society for Information Science**
  $\mathcal{SIS}$
  `Life Membership No.`
  NISTADS (**CSIR**)
  Dr. K S Krishana Marg
  NEW DELHI 110012
- **Indian Science Congress Association**
  $\mathcal{ISCA}$
  `Life Membership, No. L-8707 (8544)`
  14, Dr. Biresh Guha Street
  KOLKATA (CALCUTTA) 700017
- **The Society for Progress of Science**
  $\mathcal{SPS}$
  `Life Membership No.`
  Pragati Prakashan
  Post Box No. 62, New Market Begum Bridge
  MEERUT 250001
- **Regional Science Association**
  $\mathcal{RSA}$
  `Life Membership No. 380`
  CK-134, Sector-II, Salt Lake City
  KOLKATA (CALCUTTA) 700091
- **Indian Science Writers' Association**
  $\mathcal{ISWA}$
  `Life Membership No. LM-K 007`
  25/3, Sector-I
  Pushp Vihar
  NEW DELHI 110017
- **Indian Library Association**
  $\mathcal{ILA}$
  `Life Membership No. SL/5093`
  A/40-41, Flat No. 201
  Ansal Building, Dr. Mukherjee Nagar
  NEW DELHI 110009
-
- **Institute of Science, Education & Culture**
  $\mathcal{ISEC}$
  `Life Membership No.`
  ISEC House, 42-B, Syed Amir Ali Avenue
  KOLKATA (CALCUTTA) 700017
- **Indian Adult Education Association**
  $\mathcal{IAEA}$
  `Life Membership No.`
  Shafiq Memorial
  17 B, Indraprastha Estate
  NEW DELHI 110002
- **All India Association for Educational Research** $\mathcal{AIAER}$
  `Life Membership No. 724 (AP 13)`
  N1/55, IRC Village
  BHUBANESWAR 751015
- **United Writers' Association**
  $\mathcal{UWA}$
  `Life Fellow Membership No. 850/03`
  75 Kamakoti Nagar, Second Cross Street
  Valasaravakkam
  CHENNAI (MADRAS) 600087
- **Indian Association of Special Libraries & Information Centres** $\mathcal{IASLIC}$
  `Life Membership No.`
  P 291, CIT Scheme 6M
  Kankurgachi
  KOLKATA (CALCUTTA) 700054

- **All India Muslim Educational Society** $\mathcal{AIMES}$
  `Life Membership No.`
  A-1-D, Anugraha
  19, Nungambakkam High Road
  CHENNAI (MADRAS) 600034

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

- **Ibn Sina Academy of Medieval Medicine & Sciences** $\mathcal{IAMMS}$
  `Life Membership No.`
  Tijara House
  Dodhpur
  ALIGARH 202002

- **The Muslim Association for the Advancement of Science** $\mathcal{MAAS}$
  `Life Associate No. 9701B130`
  Darul Fikr, The Main Road
  Iqra Colony
  New Sir Syed Nagar
  ALIGARH 202002

- **Indian Association for Islamic Economics** $\mathcal{IAFIE}$
  `Life Membership No.`
  4-1212
  Sir Syed Nagar
  ALIGARH 202002

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