

## Résumé\*

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*Assistant Professor,*

Department of Mathematics and Sciences, College of Arts and Applied Sciences (CAAS)

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**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 Mathematics.

### EDUCATION

**Ph.D** (Mathematical Physics), The Institute of Mathematical Sciences, Madras, India (1991-1997).

*Dissertation:* Development of quantum mechanical treatment for the study of transport of charged-particle beams through electromagnetic systems.

*Advisor:* Professor Ramaswamy Jagannathan.

**M.Sc.** (Physics), Indian Institute of Technology (IIT), Kanpur, India (1988-1990).

**B.Sc. Honors** (Physics), Osmania University, Hyderabad, India (1985-1988).

**Computer Experience:** Familiar with UNIX/LINUX, Mathematica, LaTeX, Microsoft Office, and basic Web-Designing.

### TEACHING EXPERIENCE

**Full-time Lecturer** Dhofar University, Salalah, Sultanate of Oman, 2015 – Present.

Salalah College of Technology, **SCOT**, May-2006 – 2015.

Middle East College of Information Technology, **MECIT**, 2003-2006.

**Mathematics Teaching:** Foundation Mathematics, Statistics, College Mathematics, Calculus with Numerical Methods, Advanced Calculus and Engineering Mathematics

**Physics Teaching:** Physics-1 for Engineering, Physics-2 for Engineering, Physics, Engineering Mechanics and Engineering Physics.

### Other activities

- Drafted the syllabus for the new Bachelor of Science Programme.
- Set up the Department Homepage on the College Intranet, which contains in-house prepared *Lecture Notes* and *Question Banks*, meeting most of the requirements of all the courses offered by the department.
- Conducted the *first* Mathematics Olympiad in the College on 26 May 2004.
- Served on College Committees: *Disciplinary Committee*, *Journal Committee*, *Library Committee*, *Web-Site Committee*, *Prizes and Awards Committee*, and *Accreditation Steering Committee*.

### RESEARCH EXPERIENCE

1. *CONACYT-UNAM Postdoctoral Fellow*, Centro de Ciencias Físicas, Universidad Nacional Autónoma de México, Cuernavaca, MÉXICO (October 2001 — October 2002).  
**Advisor:** Professor Kurt Bernardo Wolf.  
**Research:** Unified treatment of light beam optics and polarization.
2. *INFN Post-Doctoral Fellow*, Istituto Nazionale di Fisica Nucleare (INFN), Dipartimento di Fisica Galileo Galilei, Università di Padova, ITALY (October 1997 — October 1999).  
**Advisor:** Professor Modesto Pusterla.  
**Research:** Beam Halo Problem.
3. **Independent Research** (see peer-reviewed publications, 6-12, 14-16 and the 5 Book-Chapters).

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\* Updated on Friday the 26 January 2018.

**<http://SameenAhmedKhan.webs.com/>**

## HONORS AND AWARDS

**Mathematics Olympiads:** Won the State Level Mathematics Olympiads at: Junior Level (1983), Senior Level (1985) and Undergraduate Level (1986 to 1988), conducted by The Andhra Pradesh Association of Mathematics Teachers (APAMT), Hyderabad, India.

**Young Physicists Colloquium:** Invited Lecture at the Young Physicists Colloquium Kolkata (Calcutta), August 1996, Organized by The Indian Physical Society (IPS).

**PROFESSIONAL AFFILIATIONS** Optical Society of America

**PATENTS** **Quadricmeter** (*in process*, <http://SameenAhmedKhan.webs.com/quadricmeter.html>).

**INTEGER SEQUENCES** **35 Integer Sequences** (in *The On-Line Encyclopedia of Integer Sequences*, [http://oeis.org/wiki/User:Sameen\\_Ahmed\\_Khan](http://oeis.org/wiki/User:Sameen_Ahmed_Khan)).

**PUBLICATIONS: Listing in SCOPUS:** <http://www.scopus.com/authid/detail.url?authorId=8452157800>

## BOOKS

1. Sameen Ahmed Khan, *International Year of Light and Light-based Technologies*, LAP LAMBERT Academic Publishing, Germany (Thursday the 30 July 2015), 96 pages. <http://www.lap-publishing.com/>, <http://isbn.nu/9783659764820/>. **ISBN-13:** 978-3-659-76482-0, **ISBN-10:** 3659764825 and **EAN:** 9783659764820.
2. Sameen Ahmed Khan, *Introductory Physics Laboratory Manual*, LAP LAMBERT Academic Publishing, Germany (Wednesday the 19 August 2015), 168 pages. <http://www.lap-publishing.com/>, <http://isbn.nu/9783659771897/>. **ISBN-13:** 978-3-659-77189-7, **ISBN-10:** 3659771899 and **EAN:** 9783659771897
3. Sameen Ahmed Khan, *Objective Questions in Introductory Physics*, LAP LAMBERT Academic Publishing, Germany (Friday the 9 October 2015), 408 pages. <http://www.lap-publishing.com/>, <http://isbn.nu/9783659786198>. **ISBN-13:** 978-3-659-78619-8 and **ISBN-10:** 3659786195 and **EAN:** 9783659786198

## BOOK CHAPTERS

1. 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, India 1995), pp. 308-321. (ISBN-10: 8170234883 and ISBN-13: 978-8170234883).
2. R. Jagannathan and S. A. Khan, **Quantum theory of the optics of charged particles**, Chapter-4 in *Advances in Imaging and Electron Physics*, *Editors:* P. W. Hawkes, B. Kazan and T. Mulvey, **97**, 257-358 (1996). Academic Press, San Diego, [http://dx.doi.org/10.1016/S1076-5670\(08\)70096-X](http://dx.doi.org/10.1016/S1076-5670(08)70096-X)
3. Sameen Ahmed Khan, **Wavelength-Dependent Effects in Light Optics**, Chapter-6 in *New Topics in Quantum Physics Research*, *Editors:* Volodymyr Krasnoholovets and Frank Columbus, (Nova Science Publishers, New York, <http://www.novapublishers.com/>) pp. 163-204 (30 December 2006).
4. Sameen Ahmed Khan, **The Foldy-Wouthuysen Transformation Technique in Optics**, Chapter-2 in *Advances in Imaging and Electron Physics*, *Editor:* Peter W. Hawkes, **152**, 49-78 (August 2008). Elsevier, [http://dx.doi.org/10.1016/S1076-5670\(08\)00602-2](http://dx.doi.org/10.1016/S1076-5670(08)00602-2)
5. Sameen Ahmed Khan, **Number Theory and Resistor Networks**, Chapter-5 in *Resistors: Theory of Operation, Behavior and Safety Regulations*, *Editor:* Roy Abi Zeid Daou, (Nova Science Publishers, New York, 2013, <http://www.novapublishers.com/>), pp. 99-154 (May 2013).
6. Sameen Ahmed Khan, **Coordinate Geometric Generalization of the Spherometer and Cylindrometer**, Chapter-8 in *Advances in Engineering Research*, Volume 10, *Editor:* Victoria M. Petrova, (Nova Science Publishers, New York, 2015, <http://www.novapublishers.com/>), pp. 163-190 (10 July 2015). ISBN-10: 1634827848 and ISBN-13: 978-1-63482-784-3.
7. Sameen Ahmed Khan, **International Year of Light and History of Optics**, Chapter-1 in *Advances in Photonics Engineering, Nanophotonics and Biophotonics*, *Editor:* Tanya Scott, (Nova Science Publishers, New York, 2016), pp. 1-56 (15 March 2016). ISBN-10: 163484498X and ISBN-13: 978-1-63484-498-7).

8. G. B. V. S. Lakshmi, Shumaila, Sameen Ahmed Khan, Azher M. Siddiqui, **Thin Films: Polyaniline and Poly(3-methylthiophene)**, in *Encyclopedia of Plasma Technology* (First Edition), Editor: J. Leon Shohet (Taylor & Francis Encyclopedia Program), pp. 1442-1451, (Monday the 12 December 2016). ISBN-10: 146650059X and ISBN-13: 9781466500594. <http://dx.doi.org/10.1081/E-EPLT-120053953> and <https://www.crcpress.com/Encyclopedia-of-Plasma-Technology/Shohet/9781466500594>.
9. Sameen Ahmed Khan, **Quantum Methodologies in Maxwell Optics**, Chapter-2 in *Advances in Imaging and Electron Physics*, Editor: Peter W. Hawkes, **201**, 57-135 (Tuesday the 08 August 2017). Elsevier, <http://dx.doi.org/10.1016/bs.aiep.2017.05.003>.
10. Sameen Ahmed Khan, **Synchrotron Radiation from Prediction to Production**, Chapter-4 in *Horizons in World Physics*, Volume **294**, Editor: Albert Reimer, (Nova Science Publishers, New York, 2017, <http://www.novapublishers.com/>), pp. 123-178 (01 November 2017). ISBN-10: 1536125156 and ISBN-13: 978-1-53612-515-3.

## PEER-REVIEWED JOURNALS

1. S. A. Khan and R. Jagannathan, **Quantum mechanics of charged particle beam transport through magnetic lenses**, *Physical Review E* **51**, 2510-2515 (1995). <http://dx.doi.org/10.1103/PhysRevE.51.2510>
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*, **A7** (4), 583-587 (2000). <http://dx.doi.org/10.1007/s100500050430>
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**, 461-464 (2001). [http://dx.doi.org/10.1016/S0168-9002\(01\)00108-5](http://dx.doi.org/10.1016/S0168-9002(01)00108-5)
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 (JOSA)*, **A19** (12), 2436-2444 (December 2002). <http://dx.doi.org/10.1364/JOSAA.19.002436>
6. Sameen Ahmed Khan, **Wavelength-dependent modifications in Helmholtz Optics**, *International Journal of Theoretical Physics*, **44** (1), 95-125 (January 2005). Kluwer Academic Publishers, <http://dx.doi.org/10.1007/s10773-005-1488-0>
7. Sameen Ahmed Khan, **An Exact Matrix Representation of the Maxwell's Equations**, *Physica Scripta*, **71** (5), 440-442 (2005). <http://dx.doi.org/10.1238/Physica.Regular.071a00440>
8. Sameen Ahmed Khan, **The Foldy-Wouthuysen Transformation Technique in Optics**, *Optik - International Journal for Light and Electron Optics*, **117** (10), 481-488 (October 2006). Elsevier, <http://dx.doi.org/10.1016/j.ijleo.2005.11.010>
9. Sameen Ahmed Khan, **Maxwell Optics of Quasiparaxial Beams**, *Optik - International Journal for Light and Electron Optics*, **121** (5), 408-416 (March 2010). Elsevier, <http://dx.doi.org/10.1016/j.ijleo.2008.07.027>
10. Sameen Ahmed Khan, **Can the Photon Velocity be derived from the Klein-Gordon equation?**, *Optik - International Journal for Light and Electron Optics*, **122** (15), 1324-1325 (August 2011). Elsevier, <http://dx.doi.org/10.1016/j.ijleo.2010.08.016>
11. Sameen Ahmed Khan, **Farey Sequences and Resistor Networks**, *Mathematical Sciences - Proceedings of the Indian Academy of Sciences*, **122** (2), 153-162 (May 2012). (Publication of the Indian Academy of Sciences, Copublished with Springer). <http://dx.doi.org/10.1007/s12044-012-0066-7>.
12. Sameen Ahmed Khan, **Aberrations in Maxwell Optics**, *Optik - International Journal for Light and Electron Optics*, **125** (3), 968-978 (February 2014), Elsevier, <http://dx.doi.org/10.1016/j.ijleo.2013.07.097>.
13. Sameen Ahmed Khan and Farooq Ahmed Khan, **Phenomenon of Motion of Salt along the Walls of the Container**, *International Journal of Current Engineering and Technology (IJCET)*, **5** (1), 368-370 (February 2015). <http://dx.doi.org/10.14741/Ijcet/22774106/5.1.2015.66>
14. Sameen Ahmed Khan, **Primes in Geometric-Arithmetic Progression**, *Global Journal of Pure and Applied Mathematics (GJPAM)*, **12** (2), 1161-1180 (March-April 2016). Print ISSN: 0973-1768 and Online ISSN: 0973-9750. <http://www.ripublication.com/gjpam.htm>

15. Sameen Ahmed Khan, **Passage from scalar to vector optics and the Mukunda-Simon-Sudarshan theory for paraxial systems**, *Journal of Modern Optics*, **63** (17), 1652-1660 (September 2016). Taylor & Francis, <http://dx.doi.org/10.1080/09500340.2016.1164257>
16. Sameen Ahmed Khan, **Quantum Methodologies in Helmholtz Optics**, *Optik - International Journal for Light and Electron Optics*, **127** (20), 9798-9809 (October 2016). Elsevier, <http://dx.doi.org/10.1016/j.ijleo.2016.07.071>
17. Sameen Ahmed Khan, **Quantum Methods in Light-Beam Optics**, *Optics & Photonics News (OPN)*, **27** (12), 47 (December 2016). (Monthly, Publication of the Optical Society of America).
18. Sameen Ahmed Khan, **Hamilton's Optical-Mechanical Analogy in the Wavelength-dependent Regime**, *Optik - International Journal for Light and Electron Optics*, **130C**, 714-722 (February 2017). Elsevier, <http://dx.doi.org/10.1016/j.ijleo.2016.10.112>.
19. Sameen Ahmed Khan, **Linearization of Wave Equations**, *Optik - International Journal for Light and Electron Optics*, **131**, 350-363 (February 2017). Elsevier, <http://dx.doi.org/10.1016/j.ijleo.2016.11.073>
20. Sameen Ahmed Khan, **Polarization in Maxwell Optics**, *Optik - International Journal for Light and Electron Optics*, **131**, 733-748 (February 2017). Elsevier, <http://dx.doi.org/10.1016/j.ijleo.2016.11.134>.
21. Sameen Ahmed Khan, **Coordinate Geometric Generalization of the Spherometer**, *Far East Journal of Mathematical Sciences (FJMS)*, **101** (03), 619-642 (February 2017). Print ISSN: 0972-0871 and Online ISSN: 0973-7006. <http://dx.doi.org/10.17654/MS101030619>
22. Sameen Ahmed Khan, **Aberrations in Helmholtz Optics**, *Optik - International Journal for Light and Electron Optics*, **153C**, 164-181 (January 2018). Elsevier, <https://doi.org/10.1016/j.ijleo.2017.10.006>.
23. Sameen Ahmed Khan and Modesto Pusterla, **On the form of Lorentz-Stern-Gerlach force**, (*submitted*).
24. Sameen Ahmed Khan, Ramaswamy Jagannathan and Rajiah Simon, **Foldy-Wouthuysen transformation and a quasiparaxial approximation scheme for the scalar wave theory of light beams**, (*submitted*).

#### PUBLICATIONS IN CONFERENCE PROCEEDINGS

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.
2. 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, India 1995), pp. 308-321.
3. R. Jagannathan and S. A. Khan, **Quantum mechanics of accelerator optics**, *ICFA Beam Dynamics Newsletter*, **13**, 21-27 (April 1997). (ICFA: International Committee for Future Accelerators).
4. S. A. Khan, **Quantum theory of magnetic quadrupole lenses for spin- $1/2$  particles**, in: *Proceedings of the 15th Advanced ICFA Beam Dynamics Workshop on Quantum Aspects of Beam Physics*, (4-9 January 1998, Monterey, California USA), Editor: Pisin Chen, (World Scientific, Singapore, 1999), pp. 682-694.
5. 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.
6. Sameen A. Khan and Modesto Pusterla, **Quantum mechanical aspects of the halo puzzle**, in: *Proceedings of the 1999 Particle Accelerator Conference PAC99* (29 March - 2 April 1999, New York City, NY), Editors: A. Luccio and W. MacKay, (IEEE Catalogue Number: 99CH36366) pp. 3280-3281.
7. 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).
8. S. A. Khan, **Quantum mechanical formalism of 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, June 2002), pp. 517-526.
9. Sameen Ahmed Khan, **The World of Synchrotrons**, *Resonance Journal of Science Education*, **6** (11), 77-84 (November 2001), (Publication of the Indian Academy of Sciences, Copublished with Springer).
10. Sameen Ahmed Khan, **Analogies between light optics and charged-particle optics**, *ICFA Beam Dynamics Newsletter*, **27**, 42-48 (June 2002). (ICFA: International Committee for Future Accelerators).

11. Sameen Ahmed Khan, **Quantum Aspects of Charged-Particle Beam Optics**, in: *Proceedings of the Fifth Saudi International Meeting on Frontiers of Physics 2016, SIMFP 2016*, (16-18 February 2016, Department of Physics, Jazan University, Gizan, Saudi Arabia). *Editors*: Ali Al-Kamli, Nurdogan Can, Galib Omar Souadi, Mohamed Fadhali, Abdelrahman Mahdy and Mahmoud Mahgoub, *AIP Conference Proceedings*, **1742**, 030008-1–030008-4 (10 June 2016). <http://dx.doi.org/10.1063/1.4953129>
12. Riti Sethi, Pravin Kumar, Sameen Ahmed Khan, Anver Aziz and Azher M. Siddiqui, **Effect of Nitrogen Ion Implantation on the Structural and Optical Properties of Indium Oxide Thin Films**, in: *Proceedings of the Fifth Saudi International Meeting on Frontiers of Physics 2016, SIMFP 2016*, (16-18 February 2016, Department of Physics, Jazan University, Gizan, Saudi Arabia). *Editors*: Ali Al-Kamli, Nurdogan Can, Galib Omar Souadi, Mohamed Fadhali, Abdelrahman Mahdy and Mahmoud Mahgoub, *AIP Conference Proceedings*, **1742**, 030016-1–030016-5 (10 June 2016). (American Institute of Physics); <http://dx.doi.org/10.1063/1.4953137>

**SELECTED E-PRINTS** ([http://arXiv.org/a/khan\\_s\\_1](http://arXiv.org/a/khan_s_1))

1. Sameen Ahmed Khan, **Wavelength-Dependent effects in Maxwell Optics**, <http://arxiv.org/abs/physics/0210027/>
2. Sameen Ahmed Khan, **A Statistical Approach to Prime Gaps and Andrica's Conjecture**, 9 pages, *E-Print*: <https://arxiv.org/abs/1702.08547> (Tuesday the14 February 2017).

**EXPOSITORY PUBLICATIONS: 18.**

**POPULAR WRITINGS: 210+**

**REFERENCES:** Available on request.