

# Prof. Ebrahim Karimi

## Canada Research Chair in Structured Quantum Waves and Quantum Communication

CONTACT INFORMATION Prof. Ebrahim Karimi  
Department of Physics  
University of Ottawa  
K1N 6N5, (Canada)  
*WWW:* sqogroup.ca

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*Fax:*  
*E-mail:* Ottawa ON

RESEARCH INTERESTS Structured Light, Structured Matter Waves, Quantum Optics, Quantum Communication, Quantum Computation, Optical Angular Momentum, Singular Optics, Classical Optics, Optics of Crystals.

EDUCATION **Università degli Studi di Napoli “Federico II”, Napoli, ITALY**  
Ph.D, Physics (Optics), January 2007- December 2009

- Project Topic: “**Generation and control of laser beams carrying orbital angular momentum for classical and quantum information applications**”
- Supervisor: Prof. Lorenzo Marrucci
- Advisor: Prof. Enrico Santamato

**Institute for Advanced Studies in Basic Sciences (IASBS), Zanjan, IRAN**

M.Sc., Physics(Optics), September 2001- November 2003

- Thesis Topic: “**A Study on Laser Cooling and Trapping of Neutral Atoms**”
- Supervisor: Prof. Arashmid Nahal
- Advisor: Prof. Yousef Sobouti

**Shahid Bahonar University of Kerman, Kerman, IRAN**

B.Sc., Applied Physics, September 1997 - September 2001

- Thesis Topic: “**Measurement in Quantum Theory**”
- Supervisor: Dr. Majid Rahnema

HONORS AND AWARDS

- [i] **CRC Canada Research Chair (Tier I)** in Structured Waves and Quantum Communication – To enhance capabilities and open new horizons in structured waves and high-dimensional quantum communication protocols, April 2024 (**under embargo**).
- [ii] **Rutherford Memorial Medal** from Royal Society of Canada – For his achievements in Quantum Science and Technology, 2023.
- [iii] **Arthur B. McDonald Fellowship** Natural Sciences and Engineering Research Council of Canada Arthur B. McDonald Fellowship – For his achievements in Quantum Science and Technology, January 2022.
- [iv] **CRC Canada Research Chair (Tier II)** in Structured Quantum Waves – To enhance capabilities and open new horizons in quantum communication protocols, simulators and sensing, January 2021.
- [v] **Herzberg Medal** from Canadian Association of Physicists - Herzberg Medal, 2020.
- [vi] **RSC - CNS Members of the College of New Scholars, Artists and Scientists of The Royal Society of Canada**, 2020 – in recognition of his groundbreaking achievement.

- [vii] **UO ECR** University of Ottawa Early Career Researcher of the Year Award 2019 – in recognition of his excellence in research in the pure and applied sciences, March 2020.
- [viii] **GYA** Member of the Global Young Academy, 2019.
- [ix] **FoS YR** Faculty of Science Young Researcher of the Year, November 2018.
- [x] **Optica Fellow** Fellow of Optica (Formerly the Optical Society (OSA)) – For outstanding and sustained contributions to the research and development of structured quantum waves, particularly singular optics, optical angular momentum, and quantum information, October 2018.
- [xi] **ERA** Ontario Early Researcher Award – Developing structured massive particle beams for improved electron and ion microscopy that could help answer unsolved puzzles in quantum physics, May 2018.
- [xii] **MPL Fellow** Visiting Fellow of the Max Planck Institute for the Science of Light in recognition of his great scientific achievements, 2018.
- [xiii] **H2020** Advisor of the Q-SORT The European Project, September 2017.
- [xiv] **CRC** Canada Research Chairs (Tier II) – Designing and fabricating novel optical and plasmonic devices that can structure single photons and optical beams, November 2015.
- [xv] **Postdoctorate fellow** PHORBITECH European project FET-Open Programme, September 2010.
- [xvi] **Best Presentation Award** (first prize) in PhD workshop, 2009.
- [xvii] **Great Strategic Programme No.11**, ICT (Information and Communication Technology) and electronic components Fellowship, 2007
- [xviii] **Top four best teachers** at the University of Kurdistan, 2006
- [xix] **Best researcher** of Faculty of Science at the University of Kurdistan, 2005
- [xx] **First rank** of undergraduate students at the University of Kerman, 2001
- [xxi] **Top six** industrial design Kharazmi Award, 1999
- [xxii] **Nominated** for the Rouzbeh Award (Iranian Physics Society), 1998

RESEARCH  
FUNDING

- Canada Research Chair Tier I (PI), April 2024 (\$1,400,000).
- QuEnSi-NSERC (co-PI), Alliance Consortia Quantum grants, March 2023 (\$500,000).
- QUINT-NSERC (co-PI), Alliance Consortia Quantum grants, March 2023 (\$420,000).
- ARAQNE-NSERC (co-PI), Alliance Consortia Quantum grants, March 2023 (\$315,000).
- NRC (PI), Ground-based Quantum Network Over the City of Ottawa, March 2023 (\$350,000).
- Arthur B. McDonald Fellowship - High-resolution hybrid quantum-enhanced imaging and readout, September 2022 (\$310,000).
- NRC (PI-Contract) - High-resolution hybrid quantum-enhanced imaging and readout, March 2022 (\$838,200).
- NSERC Research Tools & Instruments (PI), April 2022 (\$50,315).
- Canada Research Chair (PI), January 2021 (\$500,000).
- NSERC Discovery Accelerator Grants (PI), April 2021 (\$120,000).
- NSERC Discovery Grant (PI), April 2021 (\$305,000).
- Canada Research Chair Tier II (PI), November 2020 (\$500,000).
- HTSN (PI-Contract) - High Throughput Secure Networks, November 2020 (\$199,980).
- NSERC Research Tools & Instruments (PI), April 2020 (\$108,100).
- HTSN (PI-Contract) - High Throughput Secure Networks, March 2020 (\$1,980,000).

- University of Ottawa Early Career Researcher of the Year Award, March 2020 (\$10,000).
- National Research Council Canada (NRC)-uOttawa Joint Centre for Extreme Photonics (JCEP) (PI), April 2019 (\$560,000).
- NSERC Research Tools & Instruments (PI), April 2019 (\$150,000).
- Ontario Early Researcher Award (PI), May 2018 (\$150,000).
- Max Planck Institute for the Science of Light (PI - Contract), January 2018 (\$247,000).
- NSERC Research Tools & Instruments (PI), April 2018 (\$149,742).
- Canada Foundation for Innovation - IF (Infrastructure) (PI), November 2017 (\$507,014).
- Canada First Research Excellence Fund (Co-Investigator), September 2016 (\$1,145,388).
- NSERC Discovery Grant (PI), April 2016 (\$160,000).
- Canada Research Chair Tier II (PI), November 2015 (\$500,000).
- Canada Foundation for Innovation - JELF (Infrastructure) (PI), November 2015 (\$374,704).
- University of Ottawa (PI) – Startup 2015 (\$208,000).

ACADEMIC  
EXPERIENCE

*Co-Director of the University of Ottawa Nexus for Quantum Technologies* **January 2022 - present**  
*Tier 1 Canada Research Chair in Structured Waves and Quantum Communication* **April 2024 - present**

*Tier 2 Canada Research Chair in Structured Quantum Waves* **January 2021 - April 2024**

*Tier 2 Canada Research Chair in Structured Light* **November 2015 - January 2021**

*Associate Professor* **April 2020 - present**

*Assistant Professor* **April 2015 - March 2020**

**Group leader of “Structural” Quantum Optics, University of Ottawa, Canada**

*Visiting Professor* **January 2024 - 2029**

**Institute for Quantum Studies, Chapman University, USA.**

*Visiting Professor* **January 2017 - present**

**Max Planck Institute for the Science of Light, Erlangen, Germany.**

*Adjunct Professor* **January 2016 - October 2022**

**Institute for Advanced Studies in Basic Sciences, Zanjan, Iran**

*Postdoctoral Fellow* **September, 2012 - March 2015**

**Prof. Robert W. Boyd’s Group, University of Ottawa, Canada**

*Postdoctoral Fellow* **January, 2010 - September 2012**

**Università degli Studi di Napoli “Federico II”, Napoli, ITALY**

*Researcher and University Lecturer* **September, 2004 - January, 2007**

**University of Kurdistan, Sanandaj, IRAN**

STUDENT  
POSTDOCTORAL  
SUPERVISION

*Postdoctoral* **Current Position**

*Dr. Robert Fickler* **Associate Professor in Tampere University of Technology**

*Dr. Eliahu Cohen* **Associate Professor in Bar-Ilan University**

*Dr. Yingwen Zhang* **Research Officer at NRC**

*Dr. Sergey nechayev* **Senior Researcher – Ferdinand-Braun-Institut**

*Dr. Farshad Nejadstattari*  
*Dr. Igor Khanonkin*  
*Dr. Mohammadreza Rezaee*  
*Dr. Tugrul Guner*  
*Dr. Shilong Liu*  
*Dr. Xiaojin Gao*  
*Dr. Qasem Exirifard*  
*Dr. Alessio D'Errico*  
*Dr. Francesco Di Colandrea*  
*Dr. Yishai Klein*  
*Dr. Farid Ghobadi*

**Part-Time Professor in Universel College**  
**Rothschild Fellowship - PDF in Technion**  
**Mitacs National Quantum Team Lead-Account Manager**  
**Machine Learning Operations Engineer at Novisto**  
**Chinese Government Fellowship - INRS**  
**Assistant Professor in Nanjing University**  
**Senior Data Scientist - Global Affairs Canada**  
**In progress - the SQO**  
**In progress - the SQO**  
**In progress - the SQO**  
**In progress - the SQO**

*PhD/MSc Student*

**Current Position**

*Frédéric Bouchard*  
*Jeremie Harris*  
*Ali Akbar Ahangary*  
*Mohammad Yousef Alvandi*  
*Fatimah Alsaiani*  
*Alicia Sit*  
*Manuel Ferrer*  
*Ashlin Jacob*  
*Felix Hufnagel*  
*Dilip Paneru*  
*Tareq Jaouni*  
*Nazanin Dehghan*  
*Florian Brandt*  
*Habib Moradi*  
*Sajedeh Shahbazi*  
*Frédéric Bouchard*  
*Hugo Larocque*  
*Alicia Sit*  
*Felix Hufnagel*  
*Dilip Paneru*  
*Sana Boughdachi*  
*Florence Grenapin*  
*Nazanin Dehghan*  
*Tareq Jaouni*  
*Kevin Mannix*  
*Lukas Scarfe*  
*Rojan Abolhasani*  
*James Hubble*  
*Christian Howard*

**PhD - Research Officer at NRC**  
**PhD - Currently Co-Founder of Sharpest Minds**  
**PhD - Currently Co-Founder of an Optics Company in Iran**  
**PhD - Assistant Professor in Azad University of Qazvin**  
**PhD - Assistant Professor in University of Hafr Al Batin**  
**PhD student - Research Officer at NRC**  
**PhD student - PDF at University of Ottawa**  
**PhD student - Withdraw**  
**PhD student - PDF at Photonic Company**  
**PhD student - In progress**  
**PhD student - In progress**  
**PhD student - In progress**  
**PhD student - Withdraw**  
**MSc student - PhD at Radboud Universiteit**  
**PhD student - Withdraw**  
**MSc - Research Officer at NRC**  
**MSc student - Currently PhD student in MIT**  
**MSc student - Research Officer at NRC**  
**MSc student - PDF at Photonic Company**  
**MSc student - Currently PhD student**  
**MSc student - Currently PhD student in Germany**  
**MSc student - Teacher**  
**MSc student - Currently PhD student**  
**MSc student - Currently PhD student**  
**MSc student - In progress**  
**MSc student - In progress**  
**MSc student - In progress**  
**MSc student - In progress**  
**MSc student - In progress**

*BSc Student*

**Current Position**

*Jonah Hamer-Wilson*  
*John Grace*  
*Justin Tam*  
*Itay Kozlov*  
*Benton Qiu*  
*Lana Bozanic*

**BSc student - uOttawa**  
**BSc student - uOttawa**  
**BSc student - uOttawa**  
**BSc student - uOttawa**  
**BSc student - uOttawa**  
**BSc student - uWaterloo**

<i>James Hubble</i>	<b>BSc student - In progress</b>
<i>Tareq Jaouni</i>	<b>MSc student - uOttawa</b>
<i>Florence Grenapin</i>	<b>MSc student - uOttawa</b>
<i>Eric Culf</i>	<b>MSc student - uOttawa</b>
<i>Frédéric Bouchard</i>	<b>Research Associate at NRC</b>
<i>Jérémie Gagnon-Bischoff</i>	<b>MSc student - uOttawa</b>
<i>Hugo Larocque</i>	<b>PhD student at MIT</b>
<i>Alicia Sit</i>	<b>Research Officer at NRC</b>
<i>Dominic Mortimer</i>	<b>BSc student - uOttawa</b>
<i>Aazad Abbas</i>	<b>Medical school - uToronto</b>
<i>Nicolas Bent</i>	<b>PhD student - McGill</b>
<i>Harjaspreet Mand</i>	<b>PhD student - Imperial College London</b>

Three of my students, Frédéric Bouchard, Alicia Sit, Jeremie Harris, received federal government *Vanier Scholarships*, and my postdocs, Robert Fickler, received federal government *Banting Fellowship*, Mohammadreza Rezaee, received *Mitacs Fellowship*, Igor Khanonkin, received Israeli *Rothschild Fellowship*, and Shilong Liu, has received Postdoctoral Fellowship from *Chinese Government*.

GOOGLE	<i>Citations</i>	15022
SCHOLAR	<i>h-index</i>	60
PUBLICATION	<i>i10-index</i>	138
ANALYSIS		
PUBLICATIONS	<i>Science</i>	2
(188 ARTICLES)	<i>Science Advances</i>	3
	<i>Nature (correspondence)</i>	2
	<i>Nature Physics</i>	4
	<i>Nature Photonics</i>	4
	<i>Nature Materials</i>	1
	<i>Nature Reviews Physics</i>	1
	<i>Nature Communications</i>	7
	<i>Light: Science &amp; Applications</i>	2
	<i>Optica</i>	11
	<i>Physical Review X</i>	2
	<i>Physical Review Letters</i>	10
	<i>Applied Physics Letters</i>	6
	<i>Optics Letters</i>	13
	<i>New Journal of Physics</i>	6
	<i>Optics Express</i>	18
	<i>Physical Review A</i>	17
	<i>Physical Review D</i>	3
	<i>Physical Review E</i>	1

The names of students are underlined.

[188]- X-ray Phase Measurements by Time-Energy Correlated Photon Pairs, Y Klein, E Strizhevsky, H Aknin, M Deutsch, E Cohen, A Pe'er, K Tamasaku, T Schulli, **E Karimi**, S Shwartz *arXiv:2411.12702* (2024).

[187]- Diffraction of correlated biphotons through transparent samples, N Dehghan, A D'Errico, Y Zhang, **E Karimi**, *arXiv:2410.22635* (2024).

- [186]- First demonstration of angular-momentum-resolved electron energy-loss spectroscopy, G Bertoni, A Tavabi, P Rosi, E Rotunno, L Belsito, A Roncaglia, S Frabboni, **E Karimi**, P Tiemeijer, R Dunin-Borkowski, V Grillo & G C Gazzadi, *DOI:10.21203/rs.3.rs-4606043/v1* (2024).
- [185]- Predicting atmospheric turbulence for secure quantum communications in free space, T Jaouni, L Scarfe, F Bouchard, M Krenn, K Heshami, F Di Colandrea & **E Karimi**, *arXiv:2406.14768* (2024).
- [184]- Optimal Diffractive Focusing of Quantum Waves, MA Efremov, F Hufnagel, H Larocque, WP Schleich & **E Karimi**, *arXiv:2406.13545* (2024).
- [183]- Background resilient quantitative phase microscopy using entangled photons, Y Zhang, PA Moreau, D England, & **E Karimi** & B Sussman, *arXiv:2406.06377* (2024).
- [182]- Quantum process tomography of structured optical gates with convolutional neural networks, T Jaouni, F Di Colandrea, N Dehghan, L Amato, F Cardano & **E Karimi**, *arXiv:2402.16616* (2024).
- [181]- On the Electromagnetic Mass Dilemma, Q Exirifard, A D'Errico & **E Karimi**, *arXiv:2405.00071* (2024).
- [180]- Secure communication using low dimensional topological elements, MF Ferrer-Garcia, A Carmi, A D'Errico, H Larocque, E Cohen & **E. Karimi**, *arXiv:2212.04350* (2023).
- [179]- Observation of the spectral bifurcation in the Fractional Nonlinear Schrödinger Equation, S Liu, Y Zhang, S Virally, **E Karimi**, BA Malomed & DV Seletskiy *arXiv:2311.15150* (2023).
- [178]- Fast Adaptive Optics for High-Dimensional Quantum Communications in Turbulent Channels, L Scarfe, F Hufnagel, MF Ferrer-Garcia, A D'Errico, K Heshami & **E Karimi**, *arXiv:2311.13041* (2023).
- [177]- High-Dimensional Quantum Certified Deletion, F Hufnagel, A Broadbent & **E. Karimi** *arXiv:2304.03397* (2023).
- [176]- Symmetry and planar chirality measured with a log-polar transformation in a transmission electron microscope, AH Tavabi, P Rosi, RBG Ravelli, A Gijsbers, E Rotunno, T Guner, Y Zhang, A Roncaglia, L Belsito, G Pozzi, T Denneulin, GC Gazzadi, M Ghosh, R Nijland, S Frabboni, PJ Peters, **E Karimi**, P Tiemeijer, R Dunin-Borkowski & V Grillo, *Physical Review Applied* **22**, 014083 (2024).
- [175]- Biphoton State Reconstruction via Phase Retrieval Methods, N Dehghan, A D'Errico, F Di Colandrea & **E Karimi**, *Optica* **11**, 1115 (2024).
- [174]- Manifestation of the Berry connection in chiral lattice systems, F Di Colandrea, N Dehghan, F Cardano A D'Errico & **E Karimi**, *Communication Physics* **7**, 265 (2024).
- [173]- A genetic algorithm for the response of twisted nematic liquid crystals to an applied field, A Sit, F Di Colandrea, A D'Errico & **E. Karimi**, *Physical Review E* **109**, 054705 (2024).
- [172]- Spatially twisted liquid-crystal devices, A Sit, F Di Colandrea, A D'Errico & **E Karimi**, *APL Photonics* **9**, 056112 (2024).
- [171]- Fourier Quantum Process Tomography, F Di Colandrea, N Dehghan, A D'Errico & **E Karimi**, *npj Quantum Information* **10**, 49 (2024).

- [170]- Deep Quantum Graph Dreaming: Deciphering Neural Network Insights into Quantum Experiments, T Jaouni, C Ruiz-Gonzalez, **E Karimi**, X Gu & M Krenn, *Machine Learning: Science and Technology* **5**, 015029 (2024).
- [169]- Quantum correlation light-field microscope with extreme depth of field, Y Zhang, D England, A Orth, **E. Karimi**, & B Sussman, *Physical Review Applied* **21**, 024029 (2024).
- [168]- Intrinsic dichroism in amorphous and crystalline solids with helical light, A Jain, JL Bégin, P Corkum, **E Karimi**, T Brabec & R Bhardwaj, *Nature Communications* **15**, 1350 (2024).
- [167]- Full spatial characterization of entangled structured photons, X Gao, Y Zhang, A D’Errico, A Sit, K Heshami & **E. Karimi**, *Physical Review Letters* **132**, 063802 (2024).
- [166]- Weak measurements and quantum-to-classical transitions in free electron-photon interactions, Y Pan, E Cohen, **E Karimi**, A Gover, N Schönenberger, T Chlouba, K Wang, S Nehemia, P Hommelhoff, I Kaminer & Y Aharonov *Light: Science & Applications* **12**, 267 (2023).
- [165]- Digital discovery of 100 diverse quantum experiments with PyTheus, C Ruiz-Gonzalez, S Arlt, J Petermann, S Sayyad, T Jaouni, **E Karimi**, N Tischler, X Gu & M Krenn, *Quantum* **7**, 1204 (2023).
- [164]- Experimental Solutions to the High-Dimensional Mean King’s Problem, T Jaouni, X Gao, S Arlt, M Krenn & **E. Karimi** *Optica Quantum* **1**, 49 (2023).
- [163]- High-dimensional Encoding in the Round-Robin Differential-Phase-Shift Protocol, M Stasiuk, F Hufnagel, X Gao, AZ Goldberg, F Bouchard, **E. Karimi** & K Heshami, *Quantum* **7**, 1207 (2023).
- [162]- Effect of Aberrations on 3D optical topologies, N Dehghan, A D’Errico, T Jaouni, & **E. Karimi**, *Communications Physics* **6**, 357 (2023).
- [161]- Super-resolution enhancement in bi-photon spatial mode demultiplexing, F Grenapin, D Paneru, A D’Errico, V Grillo, G Leuchs, & **E. Karimi**, *Physical Review Applied* **20**, 024077 (2023).
- [160]- Topological transitions of the generalized Pancharatnam-Berry phase, MF Ferrer-Garcia, K Snizhko, A D’Errico, A Romito, Y Gefen, & **E. Karimi**, *Science Advances* **9**, eadg6810 (2023).
- [159]- Roadmap on structured waves, KY Bliokh, **E. Karimi**, et al., *Journal of Optics* **25**, 103001 (2023).
- [158]- Interferometric imaging of amplitude and phase of spatial biphoton states, D Zia, N Dehghan, A D’Errico, F Sciarrino, & **E. Karimi**, *Nature Photonics* **17**, 1009 (2023).
- [157]- One-Dimensional “Ghost Imaging” in Electron Microscopy of Inelastically Scattered Electrons, E Rotunno, S Gargiulo, GM Vanacore, C Mechel, AH Tavabi, R E Dunin-Borkowski, F Carbone, I Madan, S Frabboni, T Guner, **E. Karimi**, I Kaminer, V Grillo, *ACS Photonics*, *ACS Photonics* **10**, 1708 (2023).
- [156]- Kurdistan’s surge in science and higher education, A Chali, & **E. Karimi**, *Nature* **616**, 433 (2023).
- [155]- Trajectory of a massive localised wave function in a curved spacetime geometry, Q Exirifard, & **E. Karimi**, *Physical Review D* **106**, 064059 (2023).

- [154]- Quantum face recognition protocol with ghost imaging, V Salari, D Paneru, E Saglamyurek, M Ghadimi, M Abdar, M Rezaee, M Aslani, S Barzanjeh, & **E. Karimi**, *Scientific Reports* **13**, 2401 (2023).
- [153]- Experimental realisations of the fractional Schrödinger equation in the temporal domain, S Liu, Y Zhang, BA Malomed, & **E. Karimi**, *Nature Communications* **14**, 222 (2023).
- [152]- Spin-orbit coupling induced by ascorbic acid crystals, F Grenapin, A D’Errico, & **E. Karimi**, *Nanophotonics* **12**, online (2023).
- [151]- Scalable nonlinear helical dichroism in chiral and achiral molecules, J-L Bégin, A Jain, A Parks, F Hufnagel, P Corkum, **E. Karimi**, T Brabec, & R Bhardwaj, *Nature Photonics* **17**, 82 (2023).
- [150]- Manipulating the symmetry of transverse momentum entangled biphoton states, X Gao, Y Zhang, A D’Errico, F Hufnagel, K Heshami, & **E. Karimi**, *Optics Express* **30**, 21276 (2022).
- [149]- High-speed imaging of spatiotemporal correlations in Hong-Ou-Mandel interference, X Gao, Y Zhang, A D’Errico, K Heshami, & **E. Karimi**, *Optics Express* **30**, 19456 (2022).
- [148]- Gravitational distortion on photon state at the vicinity of the Earth, Q Exirifard & **E. Karimi**, *Physical Review D* **105**, 084016 (2022).
- [147]- F. Hufnagel, A. D’Errico, H. Larocque, F. Alsaiani, J. Upham & **E. Karimi**, Flat Magic Window, *Optica* **9**, 479 (2022).
- [146]- S. Liu, Y. Cui, **E Karimi** & B A. Malomed, On-demand harnessing of photonic soliton molecules, *Optica* **9**, 240-250 (2022).
- [145]- P. Rosi, F. Venturi, G. Medici, C. Menozzi, G. C. Gazzadi, E. Rotunno, S. Frabboni, R. Balboni, M. Rezaee, A.H. Tavabi, R. E. Dunin-Borkowski, **E Karimi**, V Grillo, *Journal of Applied Physics* **131**, 031101 (2022).
- [144]- Q. Exirifard & **E. Karimi**, Schrödinger equation in a general curved spacetime geometry, *International Journal of Modern Physics D*, 2250018 (2022).
- [143]- M. F. Ferrer-Garcia, A. D’Errico, A. Sit, H Larocque, and **E. Karimi**, **Polychromatic Electric Field Knots**, *Physical Review Research* **3**, 033226 (2021).
- [142]- Q. Exirifard, E. Culf, and **E. Karimi**, **Towards Communication in a Curved Spacetime Geometry**, *Communications Physics* **4**, 171 (2021).
- [141]- M. V. Berry, et al., **E. Karimi**, and M. R. Dennis, **A tribute to Marat Soskin**, *Journal of Optics* **23**, 050201 (2021).
- [140]- G. Pozzi, P. Rosi, A. H. Tavabi, **E. Karimi**, R. E. Dunin-Borkowski, and V. Grillo, **A sorter for electrons based on magnetic elements** *Ultramicroscopy*, 113287 (2021).
- [139]- A. D’Errico, F. Hufnagel, F. Miatto, M. Rezaee, and **E. Karimi**, **Full-mode Characterisation of Correlated Photon Pairs Generated in Spontaneous Downconversion**, *Optics Letters* **46**, 2388 (2021).
- [138]- D. Paneru, A. Te’eni, B. Y. Peled, J. Hubble, Y. Zhang, A. Carmi, E. Cohen, and **E. Karimi**, **Experimental tests of multiplicative Bell inequalities and the fundamental role of local correlations**, *Physical Review Research* **3**, L012025 (2021).

- [137]- S. Nechayev, J. S. Eismann, R. Alaei, **E. Karimi**, R. W. Boyd, and P. Banzer, **Kelvin's chirality of optical beams**, *Physical Review A* **103**, L031501 (2021).
- [136]- F. Tamburini, B. Thidé, I. Licata, F. Bouchard, and **E. Karimi**, **Majorana bosonic quasiparticles from twisted photons in free space**, *Physical Review A* **103**, 033505 (2021).
- [135]- F. Bouchard, D. England, P. J. Bustard, K. L. Fenwick, **E. Karimi**, K. Heshami, and B. Sussman, **Achieving ultimate noise tolerance in quantum communication**, *Physical Review Applied* **15**, 024027 (2021).
- [134]- A. H. Tavabi, P. Rosi, E. Rotunno, A. Roncaglia, L. Belsito, S. Frabboni, G. Pozzi, G. C. Gazzadi, P.-H. Lu, R. Nijland, M. Ghosh, P. Tiemeijer, **E. Karimi**, R. E. Dunin-Borkowski, and V. Grillo, **Experimental demonstration of an electrostatic orbital angular momentum sorter for electron beams**, *Physical Review Letters* **126**, 094802 (2021).
- [133]- F. Bouchard, A. Sit, Y. Zhang, R. Fickler, F. M. Miatto, Y. Yao, F. Sciarrino, and **E. Karimi**, **Two-photon interference: the Hong-Ou-Mandel effect**, *Reports on Progress in Physics* **84**, 012402 (2021).
- [132]- F. Troiani, E. Rotunno, S. Frabboni, R. B. G. Ravelli, P. J. Peters, **E. Karimi**, and V. Grillo, **Efficient molecule discrimination in electron microscopy through an optimized orbital angular momentum sorter**, *Physical Review A* **102**, 043510 (2020).
- [131]- S. Sederberg, F. Kong, F. Hufnagel, C. Zhang, **E. Karimi**, and P. B. Corkum, **Vectorized optoelectronic control**, *Nature Photonics* **14**, 680 (2020).
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[21]- **E. Karimi**, J. Leach, S. Slussarenko, B. Piccirillo, L. Marrucci, L. Chen, W. She, S. Franke-Arnold, M. J. Padgett, E. Santamato, **Spin-orbit hybrid entanglement of photons and quantum contextuality**, *Physical Review A* **82**, 022115 (2010).

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- [19]- G. Tosi, M. Baudisch, D. Sanvitto, L. Viña, A. Lemaître, J. Bloch, **E. Karimi**, B. Piccirillo, L. Marrucci, **Optical induced vortices and persistent currents in polariton condensates**, *Journal of Physics: Conference Series* **210**, 012023 (2010).
- [18]- **E. Karimi**, S. Slussarenko, B. Piccirillo, L. Marrucci, E. Santamato, **Polarization-controlled evolution of light transverse modes and associated Pancharatnam geometric phase in orbital angular momentum**, *Physical Review A* **81**, 053813 (2010).
- [17]- E. Nagali, L. Sansoni, F. Sciarrino, F. De Martini, L. Marrucci, B. Piccirillo, **E. Karimi**, E. Santamato, **Optimal quantum cloning of orbital angular momentum photon qubits via Hong-Ou-Mandel coalescence**, *Nature Photonics* **3**, 720 (2009).
- [16]- E. Nagali, F. Sciarrino, F. De Martini, B. Piccirillo, **E. Karimi**, L. Marrucci, E. Santamato, **Polarization control of single photon quantum orbital angular momentum states**, *Optics Express*, **17**, 18745 (2009).
- [15]- S. Slussarenko, **E. Karimi**, B. Piccirillo, L. Marrucci, E. Santamato, **Universal unitary gate for single-photon spin-orbit four dimension states**, *Physical Review A* **80**, 022326 (2009).
- [14]- E. Nagali, F. Sciarrino, F. De Martini, L. Marrucci, B. Piccirillo, **E. Karimi**, E. Santamato, **Quantum information transfer from spin to orbital angular momentum of photons**, *Physical Review Letters* **103**, 013601 (2009).
- [13]- E. Nagali, F. Sciarrino, L. Sansoni, F. De Martini, L. Marrucci, B. Piccirillo, **E. Karimi**, E. Santamato, **Quantum interference by coherence transfer from spin to orbital angular momentum of photons**, *Proceedings of SPIE - The International Society for Optical Engineering*, **7355**, 735507 (2009).
- [12]- **E. Karimi**, B. Piccirillo, E. Nagali, L. Marrucci, E. Santamato, **Efficient generation and sorting of orbital angular momentum eigenmodes of light by thermally tuned q-plates**, *Applied Physics Letters*, **94**, 231124 (2009).
- [11]- **E. Karimi**, B. Piccirillo, L. Marrucci, E. Santamato, **Light propagation in a birefringent plate with topological charge**, *Optics Letters*, **34**, 1225 (2009).
- [10]- **E. Karimi**, B. Piccirillo, L. Marrucci, E. Santamato, **Improved focusing with Hypergeometric-Gaussian type-II optical modes**, *Optics Express*, **16**, 21069 (2008).
- [9]- Kh. Saaidi, **E. Karimi**, Kh. Heshami, P. Seifpanahi, **Non-Hermitian Interaction of Matter and Light**, *Physica Scripta* **78**, 065002 (2008).
- [8]- M. R. Setare, **E. Karimi**, **Mapping of shape invariant potentials by the point canonical transformation**, *Int. J. Theor. Phys.* **47**, 891 (2008).
- [7]- **E. Karimi**, G. Zito, B. Piccirillo, L. Marrucci, E. Santamato, **Hypergeometric-Gaussian Modes**, *Optics Letters*, **32**, 3053 (2007).
- [6]- M. R. Setare, **E. Karimi**, **Algebraic approach to the Hulthen potential**, *Int. J. Theor. Phys.* **46**, 1381 (2007).
- [5]- M. R. Setare, **E. Karimi**, **Algebraic approach to the Kratzer potential**, *Physica Scripta* **75**, 90 (2007).
- [4]- M. T. Tavassoly, M. Amiri, **E. Karimi** and H. R. Khalesifard, **Spectral modification by line**

**singularity in Fresnel diffraction from 1D phase step**, *Optics Communication* **255**, 23 (2005).

OTHER  
PUBLICATIONS

[3]- **E. Karimi**, **Anomalous Behaviour of plane wave Near the focal point**, *Gamma Journal* **16**, 37 (2007).

[2]- A. Javadi, **E. Karimi**, **Equivalence of  $r$ ,  $E$  and  $p$  A Hamiltonian**, *Gamma Journal* **11**, 34 (2006).

[1]- **E. Karimi**, F. M. Rad, S. M. Hashemi, **Quantum states of neutron in Gravitational field**, *Gamma Journal* **5**, 32 (2005).

PATENTS

[2]- V. Grillo, L. Marrucci, **E. Karimi**, E. Santamato, *Patent application*, (US nr. **20130168577**), Converter of orbital momentum into spin momentum for the polarization of particle beams.

[1]- V. Grillo, L. Marrucci, **E. Karimi**, E. Santamato, *Patent application*, (Italy nr. **TO2011A001161**), Convertitore di momento orbitale in momento di spin per la polarizzazione di fasci di particelle.

BOOKS

[4] **Structured Light for Optical Communication** – Book Chapter, Alicia Sit, Felix Hufnagel, and **E. Karimi**, Elsevier (2021).

[3] **Electromagnetic Vortices: Wave Phenomena and Engineering Applications** – Book Chapter, Alessio D’Errico, and **E. Karimi**, John Wiley & Sons, Inc. (2021).

[2]- **Optics and Quantum mechanics**, Abdoll Hassan Bassireh, **Ebrahim Karimi**, (Danesh-Negar publisher 2007) 384 pages, ISBN:978-964-2927-23-4 (in Persian). It has been nominated as the best physics book in (2008).

[1]- **General Physics**, N. Golestanian, A. Behkami, Edited by: H. HassanAbadi, **E. Karimi**, (Alavi publisher 2001) 328 pages, ISBN:964-310-020-0 (in Persian).

CONFERENCE  
PRESENTATIONS  
(106 INVITED)

[106]- **E. Karimi**, **Quantum Physics**, Public Colloquium, Ottawa-Canada (2024). (**Invited**).

[105]- **E. Karimi**, **Quantum Microscopy**, International Summer School Quantum Physics, University of Ottawa, Ottawa-Canada (2024). (**Invited**).

[104]- **E. Karimi**, **Generation, Characterization and Applications of Structured Photons**, International workshop “Quantum Materials and Structured Light”, Ettore Majorana Foundation and Centre for Scientific Culture, Erice-Italy (2024). (**Invited**).

[103]- **E. Karimi**, **Super-resolution employing Entangled Photons**, Super-resolution meeting, Cetraro-Italy (2024). (**Invited**).

[102]- **E. Karimi**, **Structured photonics**, The University of Rostock, Germany (2024). (**Invited**).

[101]- **E. Karimi**, **Determining Amplitude and Phase of Biphoton Quantum States**, Chapman University, USA (2024). (**Invited**).

[100]- **E. Karimi**, **Structured Quantum Waves**, Chapman University, USA (2024). (**colloquium**).

[99]- F. Di Colandrea, A. D’Errico, **E. Karimi**, **Recent advances in spin-orbit photonic technologies**, SPIE Strasbourg, France (2024). (**Invited**).

[98]- **E. Karimi**, **From ghost-superresolution and biophoton quantum states to sonoluminescence**, SPIE San Francisco, USA (2024). (**Invited**).

- [97]- **E. Karimi, Photonics Quantum States: from Knots to Communication, and to Sonoluminescence**, PQE, Snowbird, USA (2024). **(Invited)**.
- [96]- **E. Karimi, From sonoluminescence to entanglement reconstruction, and beyond**, OCIP, Ottawa, Canada (2023). **(Invited)**.
- [95]- **E. Karimi, Structured photons and application in Quantum Information Processing**, Quantum Information, Turin, Italy (2023). **(Invited)**.
- [94]- **E. Karimi, Recent advances in structured photons**, Max Planck for the Science of Light, Erlangen, Germany (2023) **(Invited)**.
- [93]- **E. Karimi, Recent advances in structured photons**, Photonics North, Montreal, Canada (2023). **(Invited)**.
- [92]- **E. Karimi, Mini-course on the electromagnetic vacuum**, University of Duhok, Duhok-Iraq (2023). **(Invited)**.
- [91]- **E. Karimi, Recent advances in structured photons**, SPIE Photonics West, San Francisco (2023). **(Invited)**.
- [90]- **E. Karimi, Structured photons: Quantum or Classical?**, 10th International Symposium “Optics & its applications”, Cali, Colombia (2022). **(Invited)**.
- [89]- **E. Karimi, The second quantum revolution: a few photonics examples**, PQE 2023, Snowbird (2023). **(Invited)**.
- [88]- **E. Karimi, Sonoluminescence: the mystery of converting sound wave to light**, Salahaddin University, Kurdistan, Erbil-Iraq (2022) **(Invited)**.
- [87]- **E. Karimi, Structured Photons – Their Application in Quantum Photonics**, Symposium on the Third Generation Metamaterials (METAMATERIALS 3.1), Cetraro, Calabria, Italy (2022) **(Invited)**.
- [86]- **E. Karimi, Structured electron beams**, WE-Heraeus-Seminar: Quantum Electron Optics, Nahsholim, Israel (2022) **(Invited)**.
- [85]- **E. Karimi, Structured Photons – Their Application in Quantum Photonics**, 6th International Conference on Optical Angular momentum (ICOAM), Tampere, Finland (2022) **(Invited)**.
- [84]- **E. Karimi, Beyond Qubit with Structured Photons**, Colloquium at Tel Aviv University, Israel (2022) **(Invited)**.
- [83]- **E. Karimi, The Gorgeous Mother Nature: A Few Examples**, International Day of Light, Optics and Photonics Society of Iran (2022) **(Invited)**.
- [82]- **E. Karimi, Structured Photons: their application in quantum technologies and beyond, Henri Poincare’ Webinar Series**, Optical Polarization and Related Phenomena – SPIE (2022) **(Invited)**.
- [81]- **E. Karimi, Photons: From Fundamental Research to Application in Quantum Technologies, and Beyond**, The Physics Society of Iran Annual Meeting, (2021) **(Invited)**.
- [80]- **E. Karimi, Quantum Communication with Structured Photon**, 9th Quantum Fest, Mexico

2021 (**Invited**).

[79]- **E. Karimi, Structured Quantum Waves**, A series of lectures for IIT Kanpur, Kanpur, India 2021 (**Invited**).

[78]- **E. Karimi, Smart Ghost Imaging**, Q-Sort International Conference, Italy 2021 (**Invited**).

[77]- **E. Karimi, Quantum Physics: The second quantum revolution**, Colloquium for Iranian high-school teachers organized by Physical Society of Iran, Iran 2021 (**Invited**).

[76]- **E. Karimi, Smart Quantum Imaging**, SPIE Photonics for Quantum, Rochester Institute of Technology, US (**Invited**).

[75]- **E. Karimi, Structured Photons – Their Application in Quantum Photonics**, Colloquium at Raman Research Institute, India 2021 (**Invited**).

[74]- **E. Karimi, Quantum Physics: The Second Quantum Revolution**, A public speech for Kurdish community around the world 2021, organized by *Zeelamo Academy* (**Invited**).

[73]- **E. Karimi, Structured Quantum Waves**, Invited Speaker at International Iran Conference on Quantum Information (IICQI) – Iran 2021 (**Invited**).

[72]- **E. Karimi, Structured Photons – Their Application in Quantum Photonics**, Plenary Speaker at International Conference on Recent Trends in Photonics – National Photonics Symposium of India 2021 (**Invited**).

[71]- **E. Karimi, Structured Photons – Their Application in Quantum Photonics**, Online Colloquium for Physicists Community in Bangladesh 2021 (**Invited**).

[70]- **E. Karimi, Quantum Communication**, Colloquium at the Bu-Ali Sina University - Iran 2020 (**Invited**).

[69]- **E. Karimi, Quantum Physics and its application**, Series of Speeches For Iranian-Canadian community 2020 (**Invited**).

[68]- **E. Karimi, Quantum Optics: from Electromagnetic Waves to Photons**, Colloquium at the University of Kurdistan – Iran 2020 (**Invited**).

[67]- **E. Karimi, Structured Photons – Their Application in Quantum Photonics**, Colloquium at the University of Bristol –UK 2020 (**Invited**).

[66]- **E. Karimi, Underwater Quantum Communications**, Ocean, Coastal and River Engineering Research Centre of National Research Council Canada 2020 (**Invited**).

[65]- **E. Karimi, Quantum Communication in Ottawa**, National Research Council Canada 2020 (**Invited**).

[64]- **E. Karimi, Structured Photons – Their Application in Quantum Photonics**, International OSA Network of Students (IONS), India 2020 (**Invited**).

[63]- **E. Karimi, Cybersecurity – Quantum Cryptography**, Winter College on Optics: Quantum Photonics and Information, ICTP Trieste, Italy 2020 (**Invited**).

[62]- **E. Karimi, Structured electron waves**, Winter school on physics, IASBS, Iran 2020 (**In-**

vited).

[61]- **E. Karimi, Structured photon and its application in quantum information?**, Colloquium at University of Concordia 2019 (**Invited**).

[60]- **E. Karimi, Structured photon and its application in quantum information?**, Colloquium at Hamburg University 2019 (**Invited**).

[59]- **E. Karimi, How much information can a single quantum system carry?**, Q-Sort meeting, Erlangen, Germany 2019 (**Invited**).

[58]- **E. Karimi, Topologically structured photons and their application in quantum information**, The 7th International Symposium “Optics & its applications 2019” (OPTICS-2019), Yerevan, Armenia 2019 (**Invited**).

[57]- **E. Karimi, Topological Structures and Dynamics of Spatially Structured Optical Beams**, Canadian Association of Physicists (CAP) meeting, Simon Fraser University 2019 (**Invited**).

[56]- **E. Karimi, Recent progress in structured quantum waves**, Conference on Quantum Measurement: Fundamentals, Twists, and Applications, Trieste, Italy 2019 (**Invited**).

[55]- **E. Karimi, Topological structures and dynamics of spatially structured optical beams**, SPIE Conference, San Francisco 2019 (**Invited**).

[54]- **E. Karimi, Recent advances in quantum cryptography and quantum simulators with structured photons**, SPIE Conference, San Francisco 2019 (**Invited**).

[53] **E. Karimi, Dynamics of spatially structured light beams**, Schawlow-Townes Symposium on Photonics, Ottawa, Canada 2018 (**Invited**).

[52]- **E. Karimi, Twisted Quantum Waves**, 7th international conference on new frontiers in physics (ICNP), Crete, Greece 2018 (**Invited**).

[51]- **E. Karimi, Recent advances in Structured Quantum Waves**, University of Ulm, Germany 2018 (**Invited**).

[50]- **E. Karimi, Structured Quantum Waves’s group progress report**, Ringberg, Germany 2018 (**Invited**).

[49]- **E. Karimi, Spatial mode sorting with optimized holograms**, Jülich, Germany 2018 (**Invited**).

[48]- **E. Karimi, Twisted electrons**, Nature Conference: Frontiers in Electron Microscopy for the Physical and Life Sciences, Princeton, USA 2018 (**Invited**).

[47]- **E. Karimi, Topological structures and dynamics of spatially structured optical beams**, 2nd Joensuu Conference on Coherence and Random Polarization, Finland 2018 (**Invited**).

[46]- **E. Karimi, Quantum cryptography with twisted photons**, Japan Society of Applied Physics-SPIE Joint Symposium, Tokyo, Japan 2018 (**Invited**).

[45]- **E. Karimi, Dynamics of spatially structured optical beams, Structured light beams and their Applications**, University of Chiba, Japan 2018 (**Invited**).

- [44]- **E. Karimi, Quantum Cryptography with Structured Photons**, Guangzhou, China - November 2017 (**Invited**).
- [43]- **E. Karimi, Quantum Cryptography with Structured Photons and Quantum Hacking**, Guanajuato, Mexico - November 2017 (**Invited**).
- [42]- **E. Karimi, Measuring orbital angular momentum spectrum of electron beams**, Capri, Italy - September 2017 (**Invited**).
- [41]- **E. Karimi, Quantum Cryptography with Structured Photons**, Chernivtsi, Ukraine - September 2017 (**Invited**).
- [40]- **E. Karimi, Revealing magnetic structure of materials with twisted electrons**, Erlangen, Germany - September 2017 (**Invited**).
- [39]- **E. Karimi, Twisted electron beam: fundamentals and applications**, Crete, Greece - August 2017 (**Invited**).
- [38]- **E. Karimi, Quantum Cryptography with Structured Photons and Quantum Hacking**, NRC, Ottawa, Canada - May 2017 (**Invited**).
- [37]- **E. Karimi, Quantum Hacking**, Banff, Canada - April 2017 (**Invited**).
- [36]- **E. Karimi, Quantum Cryptography with Structured Photons**, Erbil, Kurdistan, Iraq - March 2017 (**Invited**).
- [35]- **E. Karimi, Lecture series on ‘how to conduct academic research?’**, Kurdistan, Iraq - March 2017 (**Invited**).
- [34]- **E. Karimi, Efficient generation and sorting of twisted electron beams**, Wilhelm und Else Heraeus-Seminar on Interaction of Shaped Electron Wavefunctions with Light and Matter, Bad Honnef, Germany - June 2016 (**Invited**).
- [33]- **E. Karimi, Observation of polarisation Möbius strips**, Wilhelm und Else Heraeus-Seminar on Nanophotonics and Complex Spatial Modes of Light, Bad Honnef, Germany - February 2016 (**Invited**).
- [32]- **E. Karimi, Observation of polarisation Möbius strips**, International Conference on Optical Angular Momentum (ICOAM) - New York, the USA - August 2015 (**Invited**).
- [31]- **E. Karimi, Observation of polarisation Möbius strips**, Photonics North - Ottawa, Canada - June 2015 (**Invited**).
- [30]- **E. Karimi, Five talks at the Workshop on “Structured” Waves: Concepts and Applications**, IASBS, Iran - February 2015 (**Invited**).
- [29]- **E. Karimi, Real-time imaging of spin-to-orbital angular momentum quantum state teleportation**, San Francisco, the USA - February 2015 (**Invited**).
- [28]- **E. Karimi, Holographic Electron Beam Shaping**, Obergurgl, Austria - January 2015 (**Invited**).
- [27]- **E. Karimi, Real-time visualization of Popper’s thought experiment**, Grasmere, UK - November 2014 (**Invited**).

- [26]- **E. Karimi, Structured light: concepts and applications**, Salerno, Italy - September 2014 (Invited).
- [25]- **E. Karimi, Generation and detection of Laguerre-Gauss modes using a phase-only spatial light modulator and an application to quantum computations**, San Diego, the USA - August 2014 (Invited).
- [24]- **E. Karimi, Optical angular momentum: concepts and applications**, Paris, France - July 2014 (Invited).
- [23]- **E. Karimi, Quantum computation with structured light**, Berlin, Germany - March 2014 (Invited).
- [22]- **E. Karimi, Structured light meets structured materials**, Bari, Italy - February 2014 (Invited).
- [21]- **E. Karimi, Accurate encryption of an optical into a phase-only spatial light modulator**, Trieste, Italy - July 2013 (Invited).
- [20]- **E. Karimi, Quantum nature of radial degree of freedom of paraxial waves**, Glasgow, UK - June 2013 (Invited).
- [19]- **E. Karimi, Generation of an electron spin-polarisation filtering based on spin-to-orbit conversion**, Dresden, Germany - April 2013 (Invited).
- [18]- **E. Karimi, Photon orbital angular momentum: classical and quantum applications**, Erlangen, Germany - June 2012 (Invited).
- [17]- **E. Karimi, Helical electron beam: a novel degrees of freedom**, University of Modena, Modena, Italy - June 2012 (Invited).
- [16]- **E. Karimi, Laser-induced radial birefringence and spin-to-orbital optical angular momentum conversion in silver-doped glasses**, ICTP, Trieste, Italy - February 2012.
- [15]- **E. Karimi, Patterned liquid crystal plate: a novel promising tool for classical and quantum applications**, Paris, France - February 2012.
- [14]- **E. Karimi, Quantum Optics: Photon Behaviours**, Yerevan, Armenia - September 2011 (Invited).
- [13]- **E. Karimi, Photon angular momentum**, Yerevan, Armenia - September, 2011 (Invited).
- [12]- **E. Karimi, Photon orbital angular momentum: classical and quantum applications**, Mahan, Iran - February, 2011 (Invited).
- [11]- **E. Karimi, Light orbital angular momentum and its application to information theory**, Winter College on Optics and Energy, ICTP, Trieste, Italy - February, 2010.
- [10]- **E. Karimi, Generation and control of laser beams carrying orbital angular momentum for classical and quantum information applications**, IPM, Iran - January, 2010 (Invited).
- [9]- **E. Karimi, Light orbital angular momentum and its applications on the quantum information**, IASBS, Iran - January, 2010 (Invited).

- [8]- **E. Karimi**, B. Piccirillo, L. Marrucci and E. Santamato, **Generation of “needle” beams and manipulation of light beam shapes by using birefringent plates with topological charge**, First meeting on Laser, Capri, Italy - September, 2009.
- [7]- **E. Karimi**, B. Piccirillo, L. Marrucci and E. Santamato, **Generation of “needle” beams and manipulation of light beam shapes by using birefringent plates with topological charge**, Introduction to Optofluidics, ICTP, Trieste, Italy - June, 2009.
- [6]- **E. Karimi**, B. Piccirillo, L. Marrucci and E. Santamato, **Generation of singular beams of light by “Q-Plates”**, Fourth International Conference “Singular Optics (Optical Vortices): Fundamentals and Applications SO’2008” , Ukraine - September, 2008.
- [5]- **E. Karimi**, B. Piccirillo, L. Marrucci and E. Santamato, **Generation and Study of Helical Light by “Q-Plates”**, First Mediterranean Photonics Conference , Italy - June, 2008.
- [4]- **E. Karimi**, **Generation and Study of Singular Beam by “Q-Plates”**, 4th IONS Meeting, Naples, Italy - June, 2008.
- [3]- **E. Karimi**, Arashmid Nahal, **New simulation of Zeeman cooling**, Conference on Quantum Optics VI (June 2005) session I, Poland.  
([www.cft.edu.pl/QuantumOpticsVI/program.pdf](http://www.cft.edu.pl/QuantumOpticsVI/program.pdf))
- [2]- Mohammad Amiri, **E. Karimi**, **Anomalous behaviour of wave near the focal point and near the line singularity in 1D phase step**, Conference on Quantum Optics VI (June 2005) session I, Poland.  
([www.cft.edu.pl/QuantumOpticsVI/program.pdf](http://www.cft.edu.pl/QuantumOpticsVI/program.pdf))
- [1]- **E. Karimi**, F. M. Rad, H. R. M. Kholesifard, **Anomalous Behaviour of Gaussian Beam near the Focal Point**, (10th Iranian Conference of PHOTONICS - MAHAN) February 2004, Page 40.

REVIEWER

**Science-AAAS**  
**Science Advances-AAAS**  
**Nature-NPG**  
**Nature Physics-NPG**  
**Nature Photonics-NPG**  
**Nature Communications-NPG**  
**Light: Science & Applications-NPG**  
**Scientific Reports-NPG**  
**Nanoscale-- RSC**  
**Review of Modern Physics-APS**  
**Physical Review Letters-APS**  
**Physical Review X-APS**  
**Physical Review A-APS**  
**Applied Physics Letters-AIP**  
**New Journal of Physics-IoP**  
**Journal of Optics-IoP**  
**Optica-OSA**  
**Optics Letters-OSA**  
**Optics Express-OSA**  
**Journal of the Optical Society of America A-OSA**  
**Journal of the Optical Society of America B-OSA**  
**Applied Optics-OSA**  
**Optics Communications- Elsevier**

**The European Physical Journal - Applied Physics - *EDP Sciences***  
**Central European Journal of Physics - *Springer***

EXECUTIVE  
ACTIVITIES

**Committee Member** University of Ottawa Research Chairs Evaluation Committee (2022-2024).  
**Committee Member** Max Born Award Committee (Optica) (2023-2024).  
**Committee Member** NSERC Discovery Grant Evaluation Committee - Physics 1505 (2022).  
**Advisory Board** Scientific advisory board of the Canadian Quantum Encryption and Science Satellite (QEYSSat) (2016–2023)  
**Editor** Associate editor of the *Optics Express* (OSA) (2017-2022)  
**Editor** Associate editor of the *New Journal of Physics* (IoP) (2018-2020)  
**Editor** Guest editor of the *Journal of Optics* (IoP) (2021)  
**Editor** Guest editor of the *Journal of Optics* (IoP) (2019)  
**Chair of Technical Program of Photonics North** (2018–2022)  
**Chair of the 5th International Conference on Optical Angular Momentum** (2019)  
**Travelling Lecturer of the Optical Society (OSA)**  
**Conference Director** International Workshop on Structured Light and Matter: Concept and Applications, Supported by ICTP, Zanjan - Iran (2016). **Grant awarded e15,000**  
**Conference Director** International Workshop on Singularities and Topological Structures of Light, ICTP, Trieste - Italy (2013). **Grant awarded e25,000**  
**President of Naples OSA chapter** One of the organisers of IONS 12 in Napoli - Italy (2012).  
**Conference Director** Workshop on Singular Optics and its Applications to Modern Physics, ICTP, Trieste - Italy (2011). **Grant awarded e15,000**  
**Conference Director** A day on physics, University of Kurdistan, Sanandaj - Iran (2006).

COMPUTER  
SKILLS

**Mathematica Package:** *Author of Mathematica Quantum Optics Package.*  
**Languages:** Mathematica 12, 11, 10, 9, 8, 7, 6 and 5, Pascal, Matlab.  
**Applications:** L<sup>A</sup>T<sub>E</sub>X Xe<sub>T</sub>E<sub>X</sub> XePersian, and presentation software  
**Operating Systems:** Mac OS, Linux, Windows.  
**Web design:** Wordpress, iWeb.

LANGUAGE  
KNOWLEDGE

**Kurdish:** Native  
**Persian:** Excellent  
**English:** Good  
**Arabic:** Basic  
**Italian:** Basic  
**French:** Basic