Omar A. Ashour

Curriculum Vitae

Physics Department
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Education

2019 –	**Doctor of Philosophy, Physics**.
	University of California, Berkeley
Advisors:	Sinéad Griffin, James Analytis
2019 – 2020:	**Master of Arts, Physics**.
	University of California, Berkeley
2017 – 2019:	**Master of Science, Applied Science & Technology (Applied Physics)**.
	University of California, Berkeley (*Berkeley Graduate Fellow*)
GPA:	3.90/4.0
Thesis:	The Nonlinear Schrödinger Hierarchy: from Quasi Rogue Waves to Nonlinear Talbot Carpets
2013 – 2017:	**Bachelor of Science, Electrical Engineering (Optics)**.
	Texas A&M University, College Station, TX, *Summa Cum Laude, Undergraduate Research Scholar*
GPA:	4.0/4.0
Honor Roll:	8 Times
Honor Soc.:	TBΠ, HKN, ΦKΦ
Thesis:	Maximal Intensity Higher-Order Breathers of the Nonlinear Schrödinger Equation on Different Backgrounds
Advisors:	Siu A. Chin, Milivoj R. Belić

Publications

2022	**Omar A. Ashour**, Siu A. Chin, Stanko N. Nikolić, and Milivoj R. Belić. Higher-order breathers as quasi-rogue waves on a periodic background. *Nonlinear Dynamics*, Jan 2022.
2022	Stanko N. Nikolić, Sarah Alwashahi, **Omar A. Ashour**, Siu A. Chin, Najdan B. Aleksić, and Milivoj R. Belić. Multi-elliptic rogue wave clusters of the nonlinear schrödinger equation on different backgrounds. *Nonlinear Dynamics*, Jan 2022.
2022	Thais Chagas*, **Omar A. Ashour***, Guilherme Ribeiro, Wendell Silva, Zhenglu Li, Rogério Magalhães-Paniago, Yves Petroff, and Steven G. Louie. Multiple strong topological gaps and hexagonal warping in Bi_4Te_3. *Accepted, Physical Review B*, 2022.
2021	**Omar A. Ashour**. NonlinearSchrodinger: Higher-order algorithms and Darboux transformations for nonlinear Schrödinger equations. *arXiv*, page arXiv:2103.14469, 2021.
2019	Stanko N. Nikolić, **Omar A. Ashour**, Najdan B. Aleksić, Yiqi Zhang, Milivoj R. Belić, and Siu A. Chin. Talbot carpets by rogue waves of extended nonlinear schrödinger equations. *Nonlinear Dynamics*, volume 97, pages 1215–1225, 2019.
2019	Stanko N. Nikolić, **Omar A. Ashour**, Najdan B. Aleksić, Milivoj R. Belić, and Siu A. Chin. Breathers, solitons and rogue waves of the quintic nonlinear schrödinger equation on various backgrounds. *Nonlinear Dynamics*, volume 95, pages 2855–2865, 2019.

2017 Stanko N. Nikolić, Najdan B. Aleksić, **Omar A. Ashour**, Milivoj R. Belić, and Siu A. Chin. Systematic generation of higher-order solitons and breathers of the hirota equation on different backgrounds. *Nonlinear Dynamics*, volume 89, pages 1637–1649, 2017.

2017 Runze Li, **Omar A. Ashour**, Jie Chen, H. E. Elsayed-Ali, and Peter M. Rentzepis. Femtosecond laser induced structural dynamics and melting of cu (111) single crystal. an ultrafast time-resolved x-ray diffraction study. *Journal of Applied Physics*, volume 121, page 055102, 2017.

2017 Siu A. Chin, **Omar A. Ashour**, Stanko N. Nikolic, and Milivoj R. Belic. Peak-height formula for higher-order breathers of the nonlinear schrodinger equation on non-uniform backgrounds. *Physical Review E*, volume 95, page 012211, 2017.

2016 Siu A. Chin, **Omar A. Ashour**, Stanko N. Nikolic, and Milivoj R. Belic. Maximal intensity higher-order akhmediev breathers of the nonlinear schrödinger equation and their systematic generation. *Physics Letters A*, volume 380, pages 3625–3629, 2016.

2015 Siu A. Chin, **Omar A. Ashour**, and Milivoj R. Belic. Anatomy of the akhmediev breather: Cascading instability, first formation time, and fermi-pasta-ulam recurrence. *Physical Review E*, volume 92, page 063202, 2015.

⋆ These authors contributed equally.

Research Experience

2021 – **Molecular Foundry, Lawrence Berkeley National Lab**, Berkeley, CA.
Ab initio studies of topological systems and direct dark matter detection.

PI: Sinéad Griffin

2019 – 2021 **Physics Department, UC Berkeley**, Berkeley, CA.
DFT and GW calculations of topological insulators and transition metal dichalcogenides.

PI: Steven G. Louie

2017 – 2018 **NSF Nanoscale Science & Engineering Center, UC Berkeley**, Berkeley, CA.
Numerical and experimental studies of transition metal dichalcogenides and photonic waveguides.

PI: Xiang Zhang

2016 – 2017 **Texas A&M Engineering Experiment Station (TEES)**, College Station, TX.
Numerical and experimental studies of ultrafast dynamics in metal thin films

PI: Peter Rentzepis

2015 **Institute of Electronic Structure and Laser (IESL-FORTH)**, Heraklion, Greece.
Femtosecond laser machining of complex waveguide arrays

PI: Stelios Tzortzakis

2014 – 2017 **Department of Physics and Astronomy, Texas A&M University**, College Station, TX.
Studies of periodic solutions of nonlinear Schrödinger equations.

PI: Siu A. Cin, Milivoj R. Belić

Fellowships & Awards

2018 – 2019 **Anselmo J. Macchi Graduate Fellowship**, UC Berkeley

2017 – 2019 **Berkeley Graduate Fellowship**, UC Berkeley

2015, 2017 **Gathright Scholar Award** *for outstanding scholastic achievement*, Texas A&M University

2016 **Richard E. Ewing Award** *for excellence in student research*, Texas A&M University

2016 **Takreem Award** *for best student research*, Qatar Foundation for Education and Science

2014 – 2017 **_Merit Scholarship_**, Qatar Foundation for Education and Science

Community Service and Volunteer Work

2020 **_Scientist Ambassador_**, Spent four weeks as an ambassador to a first grade class, teaching them about science and answering any questions they may have about a career in the field.

2018 **_Be A Scientist_**, Worked with students at local middle schools for 6 weeks to design and conduct science experiments and foster critical thinking skills