Omar A. Ashour

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Education

UC Berkeley — **Berkeley, CA**
PhD, Physics — August 2019 - Present
- **Advisor:** Steven G. Louie

UC Berkeley — **Berkeley, CA**
MS, Applied Physics (AS&T Program) — May 2019
- **Thesis:** The Nonlinear Schrödinger Hierarchy: from Quasi Rogue Waves to Nonlinear Talbot Carpets

Texas A&M University — **College Station, TX**
B.S., Electrical Engineering (Optics), Summa Cum Laude — May 2017
- **GPA:** 4.0/4.0
- **Thesis:** *Maximal Intensity Higher-Order Breathers of the Nonlinear Schrödinger Equation on Different Backgrounds* [Link]
- **Advisors:** Siu A. Chin, Milivoj R. Belić
- **Minors:** Mathematics, Physics
- **Honors:** HKN, TBΠ, ΦΚΦ, Dean's Honor Roll (8 times), Undergraduate Research Scholar

Journal Articles

Published

- S. Nikolić, **O. Ashour**, N. Aleksić, Y. Zhang, M. Belić, S. Chin, "Talbot carpets by rogue waves of extended nonlinear Schrödinger equations." Nonlinear Dynamics **97** (2), 1215-1225 (2019). [Link]
- S. Nikolić, **O. Ashour**, N. Aleksić, S. Chin, M. Belić, "Breathers, solitons and rogue waves of the quintic nonlinear Schrödinger equation on various backgrounds", Nonlinear Dynamics 95 (4) (2019). [Link]
- **O. Ashour**, S. Nikolić, S. Chin, M. Belić, "Higher-Order Breathers as Quasi-Rogue Waves on Periodic Backgrounds." (2018) [arXiv:1810.02887]
- S. Nikolić, N. Aleksić, **O. Ashour**, M. R. Belić, and S. A. Chin, "Systematic generation of higher-order solitons and breathers of the Hirota equation on different backgrounds", Nonlinear Dynamics **89** (3), 1637-1649 (2017). [Link]
- R. Li , **O. Ashour** , J. Chen , H.E. Elsayed-Ali , P. 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, **121**, 6 (2017). [Link]
- S. Chin, **O. Ashour**, S. Nikolić, M. Belić, "Peak-height formula for higher-order breathers of the nonlinear Schrödinger equation on non-uniform backgrounds,", Phys. Rev. E., **95**, 012211 (2016) [Link]
- S. Chin, **O. Ashour**, S. Nikolić, and M. Belić, "Maximal intensity higher-order Akhmediev breathers of the nonlinear Schrödinger equation and their systematic generation", Phys. Let. A **380**, 43 (2016). [Link]
- S. Chin, **O. Ashour**, and M. Belić, "Anatomy of the Akhmediev breather: cascading instability, first formation time and Fermi-Pasta-Ulam recurrence," Phys. Rev. E **92**, 063202 (2015). [Link]

In Progress

- **O. Ashour**, "Lax Pair and Higher Order Solutions of the Nonlinear Schrödinger Hierarchy on elliptic backgrounds."
- **O. Ashour**, "Darboux's Lab: a numerical implementation of the Darboux Transformation for the nonlinear Schrödinger Hierarchy."

Experience

Research

Physics Department, UC Berkeley — **Berkeley, CA**
Graduate Student Researcher, PI: Steven Louie — August 2019 – Present

NSF Nanoscale Science & Engineering Center, UC Berkeley — **Berkeley, CA**
Graduate Student Researcher, PI: Xiang Zhang — August 2017 – December 2017

Physics Department, Texas A&M University — **College Station, TX**
Research Assistant, PIs: Milivoj Belić, Siu Chin. — Jan 2014 – May 2017

- Studies of and periodic solutions of Nonlinear Schrödinger Equations and applications to nonlinear optics.
- Implementation and development of high performance algorithms for nonlinear PDEs.

Texas A&M Engineering Experiment Station — **College Station, TX**
Research Assistant, PI: Peter Rentzepis — Jan 2016 – May 2017

- Numerical and experimental studies of ultrafast dynamics in metal thin films.

Institute of Electronic Structure and Laser (IESL-FORTH) — **Heraklion, Greece**
Research Assistant, PI: Stelios Tzortzakis — May – July 2015

- Femtosecond Laser machining of complex waveguide arrays.

Teaching

Science Program, Texas A&M University (Qatar Campus) — **Doha, Qatar**
Teaching Assistant, Supervisor: Dr. Milivoj Belić — May 2014 – Dec 2015

- PHYS-218 (mechanics) and PHYS-208 (Electricity, magnetism and optics).

Honors and Awards

Anselmo Macchi Graduate Fellowship
UC Berkeley — *2018-2019*

Berkeley Graduate Fellowship
UC Berkeley — *2017-2019*

Cornell Graduate Fellowship (Declined)
Cornell University — *2017-2018*

Undergraduate Research Scholar
LAUNCH, Undergraduate Research, Texas A&M University — *2017*

Outstanding Graduate, Class of 2017
Science Program, Texas A&M (Qatar Campus, as an affiliated research student) — *2017*

Gathright Scholar Award for Outstanding Scholastic Achievement
The Association of Former Students – Texas A&M University — *2015, 2017*

Richard E. Ewing Award for Excellence in Student Research
Texas A&M University — *2016*

Takreem Award for Best Student Research
Qatar Foundation for Education, Science and Community Development — *2016*

QF Merit Scholarship
Qatar Foundation for Education, Science and Community Development — *2014-2017*

Community Service

- **Be A Scientist mentor**: Worked with students at local middle schools to design and conduct experiments, and foster critical thinking skills.
- **QRID robotics trainer**: Volunteer work for 6 months to teach children and seniors about robotics and programming.