DR. ALEXA NITZAN STALEY

alexa.n.staley@gmail.com · 646-369-2256 · alexastaley.com

OVERVIEW

I am a physicist turned technical leader, with experience in engineering and product management. I enjoy managing people and projects, making technical design decisions, writing code, and tackling breakthrough products. In 2015, I completed my PhD in physics as commissioner at the LIGO Hanford Observatory, where my work contributed to the first ever direct detection of gravitational waves, which ultimately won the founders a Nobel Prize. Following my graduate work, I was a Software Test Engineer at a drone start-up called Airware and later joined a quantum computing start-up called Rigetti as a Quantum Engineer. I'm currently a Product Manager at Carta working on launching CartaX, designed to provide liquidity in private markets.

EXPERIENCE

Carta San Francisco, CA

Product (& Engineering[1]) Manager for CartaX Money Movement & Post Trade   *Sept '19 - Present*
- Launched Carta's cash management account used to transfer funds in, out, and between Carta Capital Markets brokerage accounts
- Product lead for the settlement service which was responsible for reconciling the cash and securities after a transaction completes
- Designed and managed the creation of the post trade service which generated reconciliation reports, statement & confirms
- Built integrations with JPM Treasury API, Plaid, and Alloy third party tools
- Designed the technical architecture for the cash management account which utilized Kafka message process and ScyllaDB.
- Contributed to the entire product development life cycle including writing product requirements, reviewing designs, writing engineering specs, committing to the code base, running manual tests, and releasing.

Rigetti Computing Berkeley, CA

Technical Lead   *May '19 – July '19*
- Responsible for the research, build-out, and integration of the next generation quantum devices
- Determined key project requirements and tracked projects' process

Quantum Engineer – Deployment Lead   *Dec'17 – May '19*
- Started a new team within the company called the Deployment team; hired and managed two direct reports.
- Accountable for maintaining deployed quantum devices continuously online for customers.
- Deployed one of the first and few quantum devices available to customers.
- Tenured sixed different chips, increased device uptime from ~50% to 80%, and decreased release times from a week to a day.
- Responsible for the integration of the quantum cloud services front-end, back-end infrastructure, and the quantum devices, resulting in several customer-facing releases and multiple deployed quantum devices.
- Co-lead scrums and sprint planning for the quantum cloud service releases, and tracked project timelines.
- Facilitated collaboration between software engineers, hardware engineers and physicists working on R&D.
- Assisted in creating engineering requirements and roadmaps for major releases.
- Explored, tested, and implemented techniques aimed at scaling and improving performance of quantum computers.
- Active contributor and reviewer of internal python code used for device characterization and recalibration.
- Subject in Seeker's "We're close to a universal quantum computer, here's where we're at."

Quantum Engineer – Full Stack Quantum Engineer   *April'17 – Dec'17*
- Characterized and implemented one- and two-qubit gate operations required for quantum computing.
- Engineered automated routines for qubit bring-up/characterization and recalibration.

Airware San Francisco, CA   *Jan'16 – April'17*

Software Test Engineer
- Designed test suites and conducted tests on the unmanned aerial vehicle ground control software to ensure robustness and guarantee safe operations of the multi-rotor and fixed-wing aircrafts.
- Maintained and refactored the test automation infrastructure as the company's product pivoted.
- Developed new test automation scripts for hardware and software in the loop tests.
- Provided feedback to product managers and software engineers on usability of ground control software.
- Collaborated and assisted in-field flight-testing team.

Advanced LIGO Observatory Hanford, WA

Commissioner   *May '13 –'15*
- Commissioned the advanced laser interferometer gravitational wave observatory, a Nobel Prize winning observatory, which made the first direct detection of gravitational waves from a binary black hole merger on September 14th, 2015.
- Designed, implemented, and automated the locking sequence to get the detector operational. To ensure a high duty cycle, Advanced LIGO requires a novel, fast, deterministic, and robust locking sequence. This locking sequence is critical to getting the detector to its optimal sensitivity.
- Involved in the development of the control loops installed in the interferometer; some of these loops included optical alignment and frequency noise stabilization.
- Experience with Pound-Drever-Hall laser stabilization, phase-locked loops, and RF demodulation.
- Created a Matlab Simulink model to simulate the feedback servos used in the interferometer. The model produced a noise budget, which was used for mitigation of dominant noise sources.
- Installed optical tables, which involved working with lasers, fiber optics, RF modulators, lenses, sensors and opto-mechanical components. Also measured, analyzed, and modeled beam profiles of the lasers beams.
- Subject in LIGO documentary: "LIGO: A Passion for Understanding"

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[1] Unofficial title

EDUCATION

Columbia University New York, NY   *Aug '11 – Oct '15*
- Doctor of Philosophy in Physics obtained October 2015. GPA: 3.9
- Dissertation Project - Arm Length Stabilization Technique: a critical step in reaching the interferometer's operating point; created a Matlab Simulink State-Space model to model all the control loops, actuators, and sensors in this technique; produced a noise budget for the technique and concluded it was reliable and robust.

Bowdoin College Brunswick, ME   *Aug '07 – May '11*
- Bachelor of Arts in Physics (major) and in Mathematics (minor); graduated Phi Beta Kappa, Magna Cum Laude, and High Honors in Physics. GPA: 3.87
- Honors Project: analyzed the Oppenheimer-Snyder dust cloud collapse into a black hole in the moving-puncture coordinate system; code was written in Fortran 90 and used techniques such as eighth-order interpolation, and fourth-order Runge-Kutta method.

SPECIAL SKILLS

- Experience with Python, Github, Gitlab, Jira, Asana, Kafka, ScyllaDB, PostgresDB, Figma, Aha, Mathematica, Matlab, Fortran 90
- Worked with monoliths and microservices; relational and non-relational databases
- Fluent in Portuguese, proficient in Spanish
- Near completion of private pilots license

ADDITIONAL INFORMATION

- Bowdoin College Varsity Indoor/Outdoor Track and Field; NYSAIS 400 meter Hurdles Championship Record Holder (2007-2013); 2017 Berkeley Half Marathon runner
- Participated in the Newport-Bermuda Sailing Race, the Round the Island sailing race in Cowes, England, the Opera House sailing race in Nantucket, and the St. Barth's Bucket
- The Chapin School mentor: spoke to upper school and sixth grade girls about being a woman in physics, and mentored middle school students competing in NAIS virtual science fair project

PRIZES

2016 Yuri Milner's Breakthrough Prize in Fundamental Physics: Awarded to the co-authors of the LIGO detection paper
2016 Forman Prize of the Optical Society of America: Awarded to the Advanced LIGO Engineering group
2016 Gruber Foundation Cosmology Prize: Awarded to the LIGO scientific collaboration for the gravitational wave detection
2010 Clare Booth Luce Scholarship: a national scholarship awarded to women conducting research in science
2009 The Edwin Herbert Hall Prize, awarded to the best sophomore scholar in the field of physics
2008 All-Academic for Varsity Track & Field

PUBLICATIONS

Demonstration of Universal Parametric Entangling Gates on a Multi-Qubit Lattice
M. Reagor *et al.*
Science Advances 10, 1126 (2018)

Parametrically Activated Entangling Gates Using Transmon Qubits
S. Caldwell *et al.*
arXiv:1712.05771 (2017)

Unsupervised Machine Learning on a Hybrid Quantum Computer
J.S. Otterbach *et al.*
arXiv:1706.06562 (2017)

GW151226: Observation of Gravitational Waves from a 22-Solar-Mass Binary Black Hole Coalescence
B.P Abbott *et al.* (LIGO Scientific Collaboration and Virgo Collaboration)
Phys. Rev. Lett. 116, 241102 (2016)

Observation of Gravitational Waves from a Binary Black Hole Merger
B.P. Abbott *et al.* (LIGO Scientific Collaboration and Virgo Collaboration)
Phys. Rev. Lett 116, 061102 (2016)

GW150914: The Advanced LIGO Detectors in the Era of the First Discoveries

B.P. Abbott *et al.* (LIGO Scientific Collaboration and Virgo Collaboration)
arXiv:1602.03838 (2016)

Achieving Resonance in the Advanced LIGO Gravitational-Wave Interferometer
A. Staley *et al.*
Class. Quant. Grav. 31 (2014) 245010

High Precision Optical Cavity Length and Width Measurements using Double Demodulation
A. Staley *et al*.
Optics Express 23(15): 19417-19431 (2015)

Observation of Parametric Instability in Advanced LIGO
K. Arai *et al.*
Physical Review Letters 114, 161102 (2015)

The Status of the Advanced LIGO Gravitational-Wave Detectors
A. Staley on behalf of the LIGO Scientific Collaboration
Rencontres de Moriond Conference Proceeding 2015

Oppenheimer-Snyder Collapse in Moving-Puncture Coordinates
Alexa N. Staley, Thomas W. Baumgarte, J. David Brown, Brian Farris, Stuart L. Shapiro.
Class.Quant.Grav. 29 (2012) 015003
e-Print: arXiv:1109.0546 [gr-qc]