

# Mark Opfell

## Exposure & Skills

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<b>RF Standards</b>	FCC, ITU, DVB-S2, CCSDS, VITA49
<b>RF Tools</b>	VNA, GNU Radio, Cloud SDRs, Antenna Hats
<b>General Software Tools</b>	Python, Git*, Bash, Excel (Wizard)
<b>Scientific Python Libraries</b>	NumPy, SciPy, Matplotlib, Pillow, Pandas
<b>Significant Volcano Summits</b>	Mount Rainier, Mount Adams (solo)

## Work Experience

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Job Title	<b>Lead Communication Systems Engineer</b>	
Employer	<b>Albedo</b>	Asynchronous Remote
Period	<b>October 2021 – Present</b>	

Creating, evaluating, and documenting space-to-ground digital communications, and the mission data chain from modulated waveform to frames, packets, and end-to-end UDP connections. Evaluated with GNU Radio software defined transceiver simulations, technical deep dives into open source communication standards, collaboration on product (satellite imagery) level vision, and merging dev code to the processing pipeline.

Created a realistic and actionable plan to increase satellite constellation average payload data throughput by 42% yielding a 14% increase in capacity (directly correlated with revenue). Validated the plan with large scale year-in-the-life Python link budget modeling and systems engineering showing minimal schedule delay, and technical risk. Continuously building consensus with the founders: CEO, CTO, and CPO, on which space and ground communication business partnerships to pursue.

Job Title	<b>Senior RF Systems Engineer</b>	
Employer	<b>LeoStella</b>	Tukwilla, WA & Remote
Period	<b>April 2019 – October 2021</b>	

Created technology roadmaps, architecture diagrams, link budgets, test plans, and ran hands-on troubleshooting. Collaborated with suppliers and customers to design, manufacture, test, launch, and operate X, S, GPS, and UHF-band space-based software defined radios linked to ground stations enabled by the AWS Ground Station product (global ground-station-as-a-service) as well as the KSAT Lite ground station network.

Designed, simulated, purchased, laid out, and validated: parts, mixed signal PCB, connectors, cabling, and enclosure for a GPS RF system self-compatibility filter. Multiple spacecraft successful in-orbit operation.

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Job Title	<b>RF Systems Engineer</b>	
Employer	<b>Kymeta</b>	Redmond, WA
Period	<b>February 2018 – March 2019</b>	

Wrote phased array antenna cross-polarization optimization algorithm in Python and integrated it with production level test codebase along with documentation, theoretical and actual response data.

Developed and executed over-the-air combined OSI application, transport, network, and physical layer level test cases for a mobile Azure cloud connected MIMO Ku-band terminal with software defined phased array flat panel antennas and a DVB-S2 satellite modem

Job Title	<b>Senior RF Systems Engineer</b>	
Employer	<b>Space Systems/Loral</b>	Mountain View, CA
Period	<b>March 2015 – January 2018</b>	

Lead successful Forward downlink payload re-design, deployment, launch, in-orbit test, and handover of geostationary communication satellite Echostar 21 operating the forward payload receive at Ka-band and transmit at S-band.

Award winning role leading, developing, and managing a production Python client and services to exchange data between a PostgreSQL database storing 1 TB of antenna data and an RF downlink capacity tool.

Wrote specifications, triaged vendors, reviewed test data collateral, and directed the installation, unit level and system level tests of the following passive and active RF units: diplexer, waveguide, directional coupler, band pass filter, low noise amplifier, downconverter, high power load, circulator, coaxial cable, master reference oscillator, and synthesizer.

Job Title	<b>RF Systems Engineer</b>	
Employer	<b>Space Systems/Loral</b>	Mountain View, CA
Period	<b>September 2013 – March 2015</b>	

Developed Python analysis tool from scratch to model complex amplitude and time delay of 10,000+ passive and active RF units for a ground-based beam-forming network.

Job Title	<b>Associate RF Systems Engineer</b>	
Employer	<b>Space Systems/Loral</b>	Mountain View, CA
Period	<b>June 2012 – September 2013</b>	

## Education

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Degree	<b>Bachelor of Science in Electrical Engineering</b>
University	<b>University of California, Davis</b>
Period	<b>June 2009 – June 2012</b>

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