

# Mark Opfell

## Exposure & Skills

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<b>RF Standards</b>	FCC, ITU, DVB-S2, CCSDS
<b>RF Tools</b>	VNA, SDR, GNU Radio, VSA
<b>General Software Tools</b>	Python, Git*, Linux, Bash
<b>Python Libraries</b>	NumPy, Matplotlib, Scapy
<b>Networking</b>	Wireshark, Cisco Networking Technician
<b>Cloud</b>	AWS EC2 & S3
<b>Significant Volcano Ascents</b>	Mount Rainier, Mount Baker, Mount Adams

## Work Experience

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Job Title	<b>RF Communications System Engineer</b>	
Employer	<b>Amazon</b>	Redmond, WA
Period	<b>July 2024 – Present</b>	

Project Kuiper

Job Title	<b>Lead Communication Systems Engineer</b>	
Employer	<b>Albedo</b>	Remote & Some Travel
Period	<b>October 2021 – March 2024</b>	

Created, evaluated, and built space-to-ground digital communications links. Developed the mission data chain from modulated waveform to frames, packets, and connections. Analyzed and tested with: GNU Radio, physical software defined transceivers, technical deep dives into open source communication standards, and Python code for the processing pipeline.

Led satellite constellation FCC and ITU regulatory filing, and RF analysis efforts.

Architected facility RF testing flow, and lab-to-cloud remote VPN network. Procured, set up, coded, and maintained FlatSat communication with test equipment, and ground station hardware & software stack.

Continuously building consensus with the founders (CTO, CEO, and CPO) on which space and ground communication business partnerships to pursue. Collaboration on product (satellite imagery) level vision, creation of a 10 year communications technology roadmap, and month-to-month schedule to break down a work plan to get launch while burning down realistic technical risks.

+1-530-848-8212  
markopfell@gmail.com  
github.com/markopfell  
linkedin.com/markopfell

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

Created RF 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.

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>	

Led 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.

Job Title	<b>Associate -&gt; 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.

## Education

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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