

GNU Radio

Project Update

Ben Hilburn

Ticket Sales



Big News: 3.8

- Huge changelog with many significant updates!
- More than 200+ contributors in the changelog.
- The release announcement garnered significant attention & interest.

Not least of which is Python 3 migration!



Packt

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Home > Programming News > Application Development News > GNU Radio 3.8.0.0 releases with new dependencies, Python 2 and 3 compatibility, and much more!

Programming News Application Development News News

GNU Radio 3.8.0.0 releases with new dependencies, Python 2 and 3 compatibility, and much more!

By Amrata Joshi - August 13, 2019 - 9:05 am 246 0

activate all the national parks in the UK during a year. In some ways it is similar to Summits On The Air (SOTA) with parks being more accessible and you can operate from a motor vehicle (<https://parksonthear.com>). Andy, 2E0UAW is the English Administrator.

As with SOTA, you have activators and chasers (hunters in POTA terms). You are required to make at least 10 QSOs in any mode you like, but not using a land based repeater. However, satellites are acceptable. The English location details can be found at <https://tinyurl.com/ybbhzfpe>.

JOT
Paddy, G-
On The
Duncourt
Duncourt
takes pla
and 20
volunteer
Repeater
Guides Ga
and the
Scout and

GNU Radio v3.8

Version 3.8 of GNU Radio has been released. This is the first update in more than six years. The changes have been noted as a GLTL:DR rather than a detailed account of what has changed. What has not changed is the fact that GNU Radio is centered around a very simple truth: "Let the developers hack on DSP. Software interfaces are for humans, not the other way around." And so, compared to the later 3.7 releases, nothing has fundamentally modified the way one develops signal processing systems with GNU Radio: you write blocks, and you combine blocks to be part of a larger signal processing flow graph. www.gnuradio.org/news/2019-08-10-gnu-radio-v3.8-0-0-release

October 2019

GNU Radio 3.8.0.0 released [LWN.net]

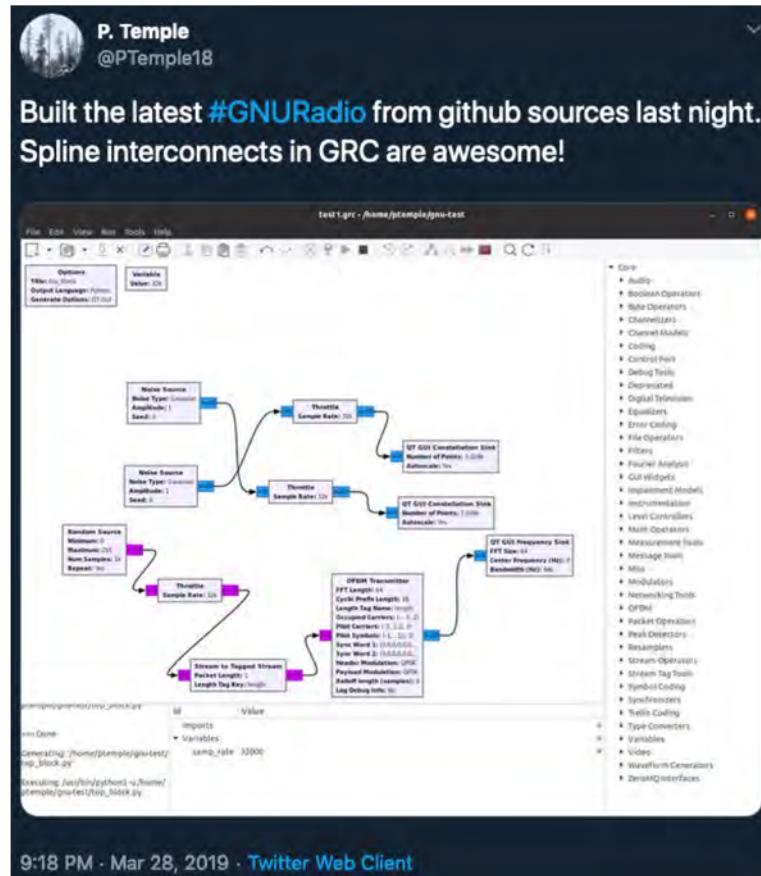
<https://lwn.net> > Articles ▾

Aug 9, 2019 - GNU Radio is an extensive framework for software-defined radio development. The 3.8.0.0 release is finally available. "It's the first minor ...

Radio Society of Great Britain Magazine

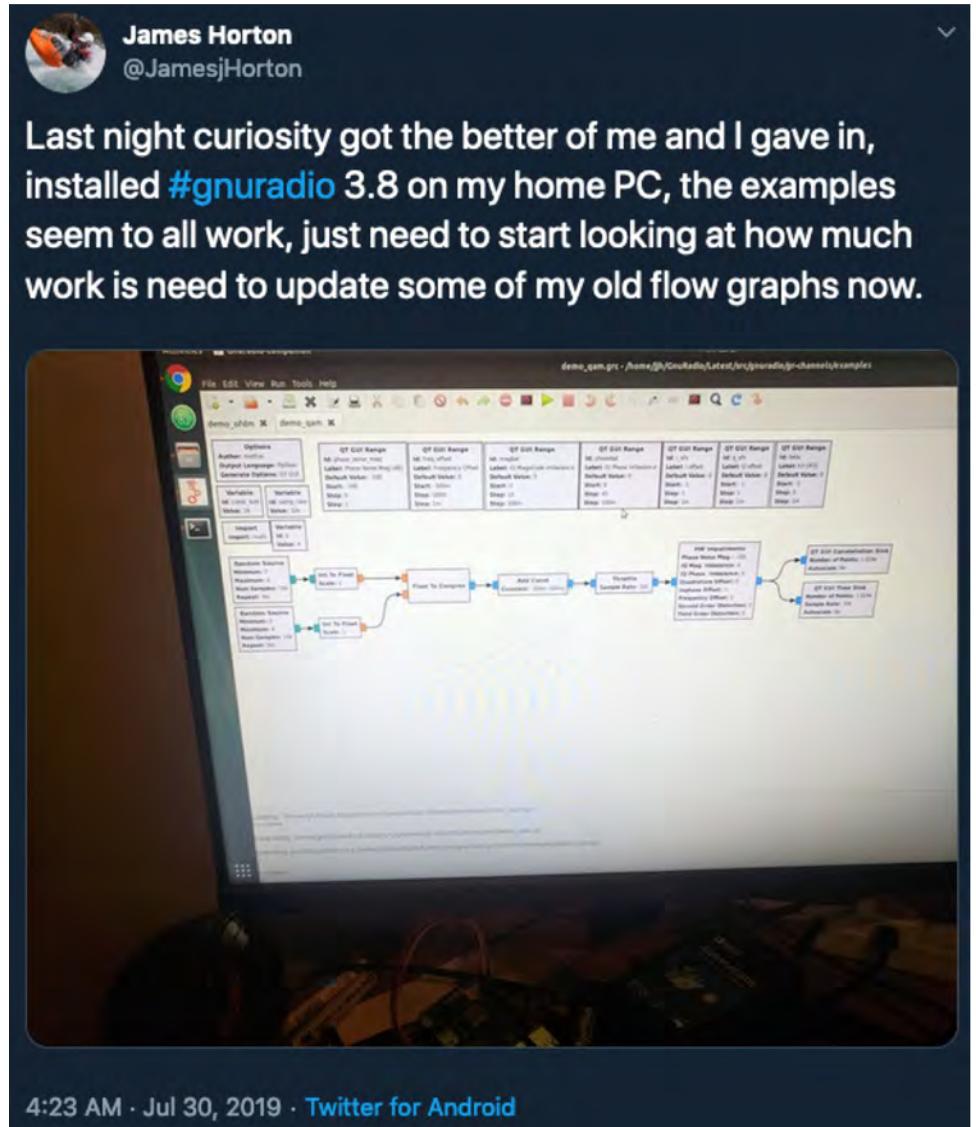
Credit: Derek Kozel

Yes, 3.8 has squiggly lines.



Of *course* the examples
just work!

Credit: James Horton



Out of Tree Modules and 3.8

- Update your OOTMs!
- The GNU Radio Wiki has a v3.8.0.0 OOT Module Porting Guide
- Thanks to Bastian Bloessl for authoring the guide!



Clayton Smith
@argilo

[Follow](#)

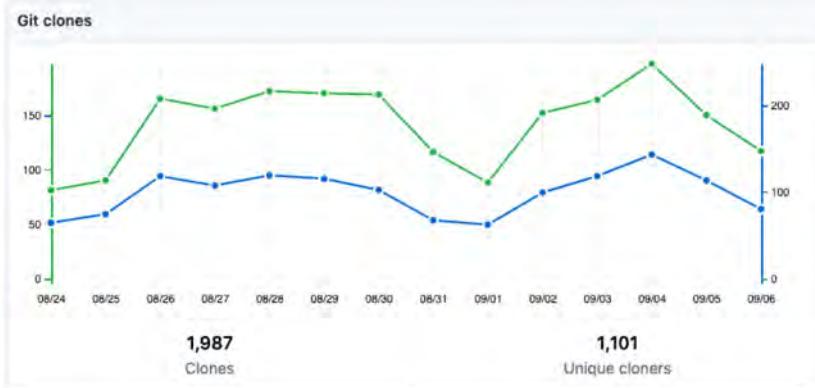
Replies to [@IanJohnBuckley](#) [@drmpeg](#) and 2 others

Thanks to the OOT Module Porting Guide it was relatively straightforward to update to 3.8. I only encountered a couple minor snags along the way, and one bug in GNU Radio which is already fixed.

8:32 PM - 27 Jul 2019

[Credit: Clayton Smith, @argilo](#)

The Stats Slide



- Unique Cloners: 34% increase
- Unique Visitors: 11% increase

Stat	2017	2018	2019	YOY
Executed CLAs	5	11	28	155%
Closed Issues	68	140	221	58%
Closed Pull Requests	177	272	443	63%

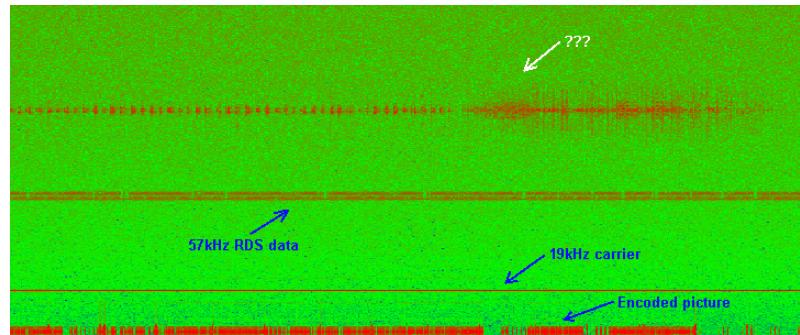
Summer Coding Programs

- Google Summer of Code
 - **Arpit Gupta:** Block Header Parsing Tool
 - Mentor: Nicolas Cuervo
 - Auto-parse your block header into GRC YAML!
 - **Bowen Hu:** gr-Verilog
 - Mentors: Sebastian Kowalski, Marcus Mueller
 - Cycle-accurate simulation of Verilog files from GRC!
- See their posters in the expo!
- Special thanks to Felix Wunsch for running GSoC!



GNU Radio Signals Challenge

- We released a SigMF recording containing three hidden messages.
- Challenges built with RDS signals and NOAA downlinks.
- Winners from United States, France, Hungary, Slovakia, The Netherlands!
- (Technically before GRCon18)



Credit: [@psbhlw](#)

SETI / GNU Radio Hackathon

- Hosted by SETI Institute, UC Berkeley SETI, and Breakthrough Prize
- 30+ attendees from industry, academia, government, and hobbyists
- Key areas of development:
 - SigMF
 - GNU Radio on the ATA
 - GNU Radio for Radio Astronomy
 - Antenna Array Monitoring & Health
 - ML for Signals Detection & Classification



Process Voyager Signals in GNU Radio!

- SigMF Recordings from the ATA:
 - <http://setiquest.info/sigmf/>
- SigMF Recordings from Green Bank Telescope:
 - blpd0.ssl.berkeley.edu/SigMF_data/
- Nick Foster's Flowgraphs:
 - <https://github.com/bistromath/voyager>
- [SETI / BL Press Release](#)

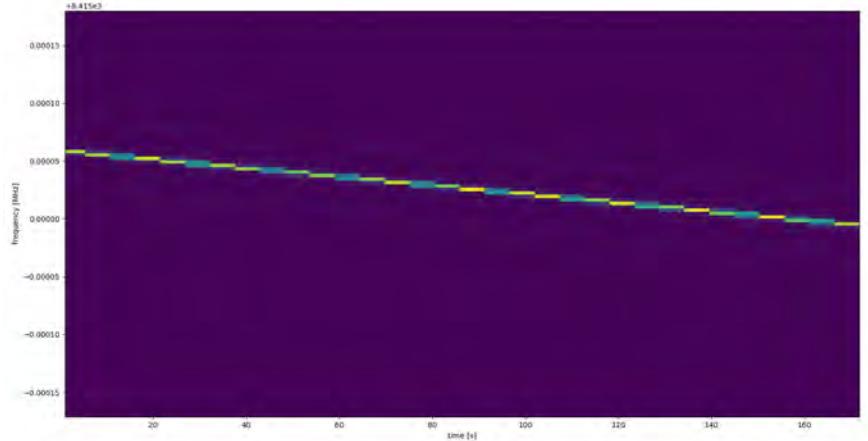
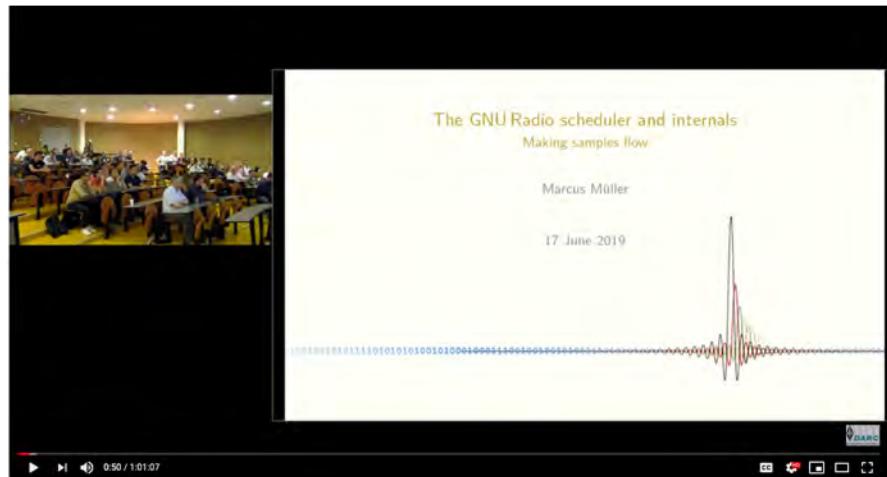




Photo credit: Derek Kozel

EU GNU Radio Days

- Second year, doubled in size!
- Held in Besançon, France
- Marcus Mueller keynoted, other officers in attendance
- EU GNU Radio Days 2020:
 - Poitiers, France
 - June 22-23rd, 2020



SDR Academy at Freidrichshafen

- 2019 was 5th year!
- One day event that brings together SDR enthusiasts and developers.
- Organized by:
 - Prof. Hartje, HS Bremen
 - Prof. Heller, U. of South Hampton
- <http://sdra.io/>



SDRA Topics:

- Advances in GNURadio related projects and research
- Algorithms, applications, architectures in SDR systems
- Real Time signal processing
- Innovative applications using modern ADC/DAC environments

The GNU Radio Community

September 2018 – September 2019

[A View from Twitter](#)



The GNU Radio Community

- “Community” can be ambiguous? Overloaded? Too narrow?
- Our best guess is the mailing list has somewhere around 5% of users.
- GRCon is a microcosm of the larger community.
- There are things happening ***constantly***.

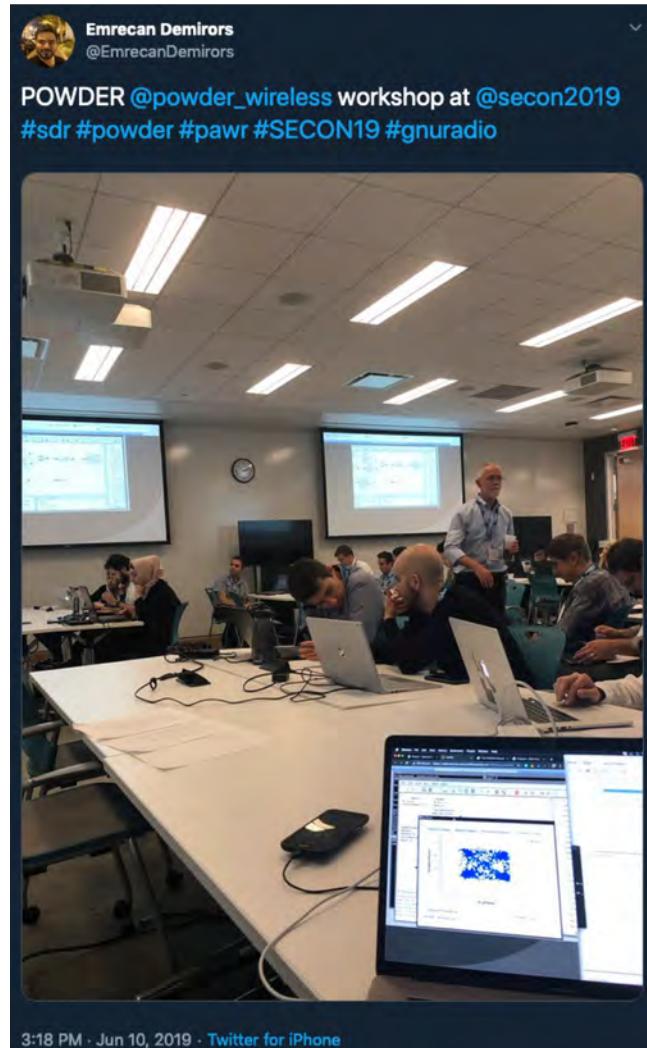
The Days are Just Packed



Chaos Communications Camp.
Photo Credit: Philip Balister

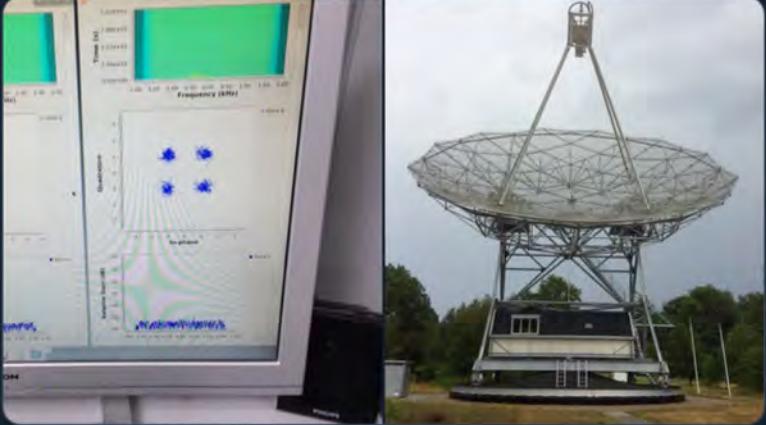
Brussels Hackerspace.
Credit: [@Stravos_IT](#)

- POWDER is an SDR testbed run by the University of Utah and Salt Lake City, using hardware from Rice University
- Part of and funded by NSF's PAWR Program



 **Cees Bassa**
@cgbassa

With the mission ending, [@radiotelescoop](#) is receiving the final telemetry and images from DSLWP-B. I'll live-tweet the final moments of this adventurous lunar orbiter. We just received the first packet. Ingress behind the Moon will be at 14:08UTC, with the crash at 14:20UTC.



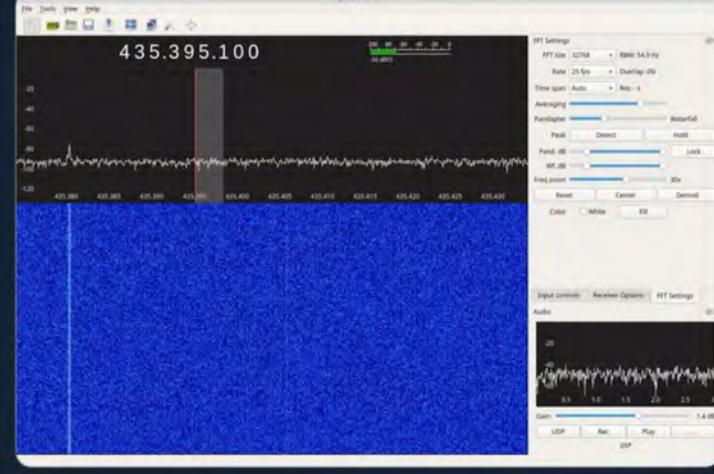
👤 BG2BHC and 3 others

9:35 AM · Jul 31, 2019 · [Twitter Web App](#)

 **Cees Bassa**
@cgbassa

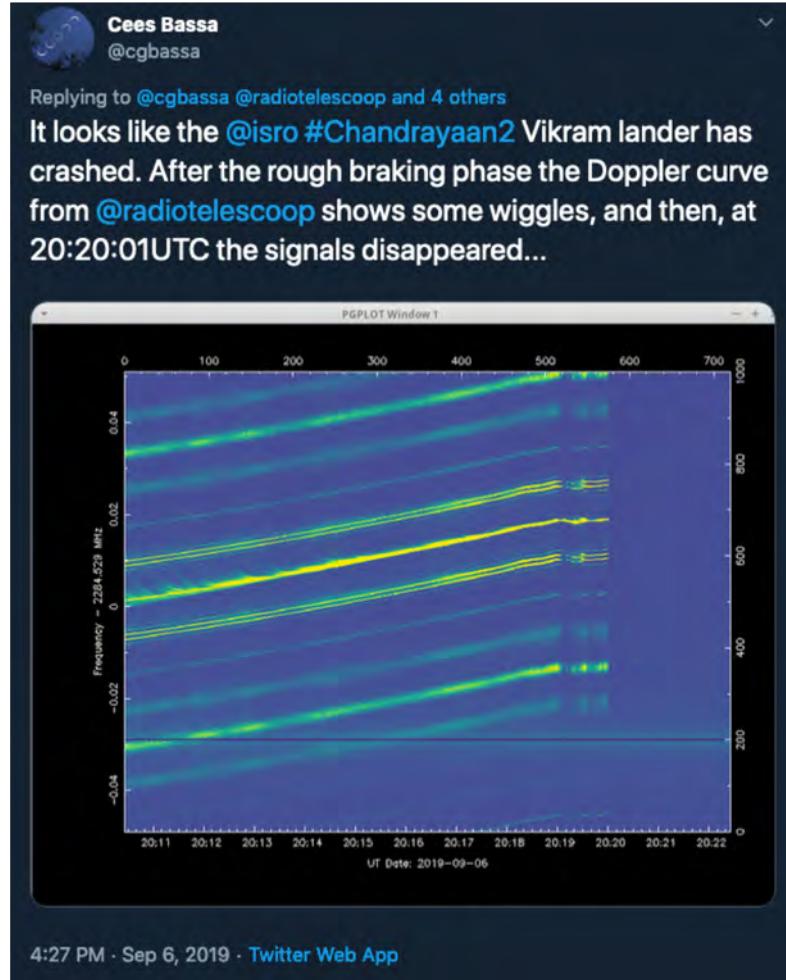
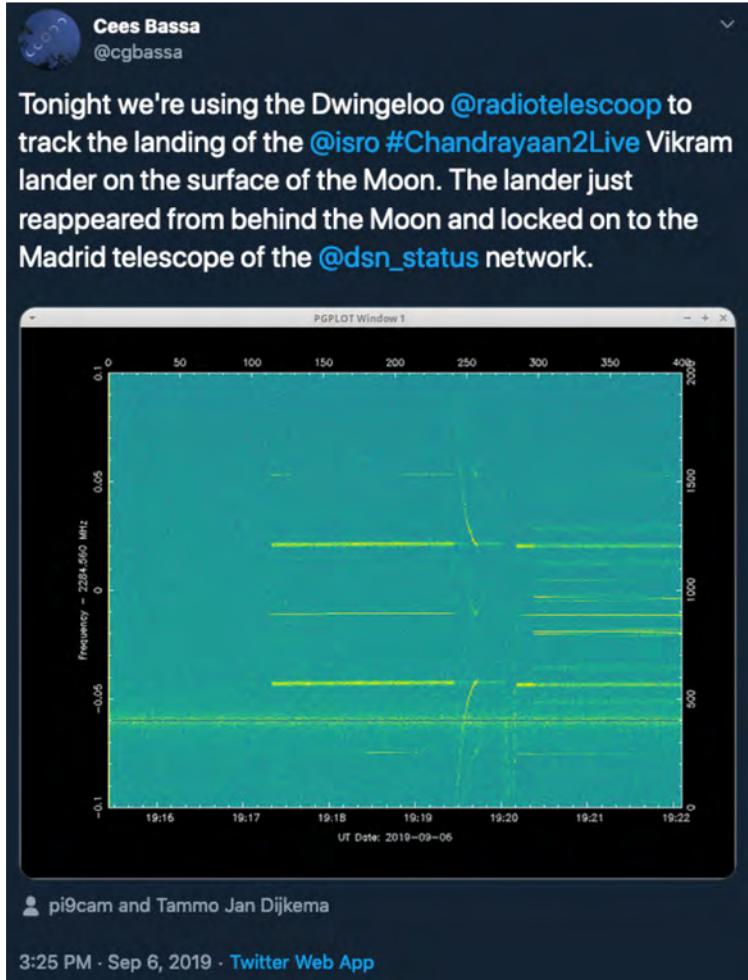
Replying to [@cgbassa](#) [@radiotelescoop](#) and 9 others

There is a new crater on the Moon... We are already 5 minutes past the moment DSLWP-B would've appeared from behind the Moon if it had not crashed. The fact that we are no longer receiving signals means it has impacted the lunar surface. RIP DSLWP-B.



10:40 AM · Jul 31, 2019 · [Twitter Web App](#)

[Credit: Cees Bassa](#)





Long March 3A rocket launches Fengyun-2H meteorological satellite

by Andrew Jones — June 5, 2018



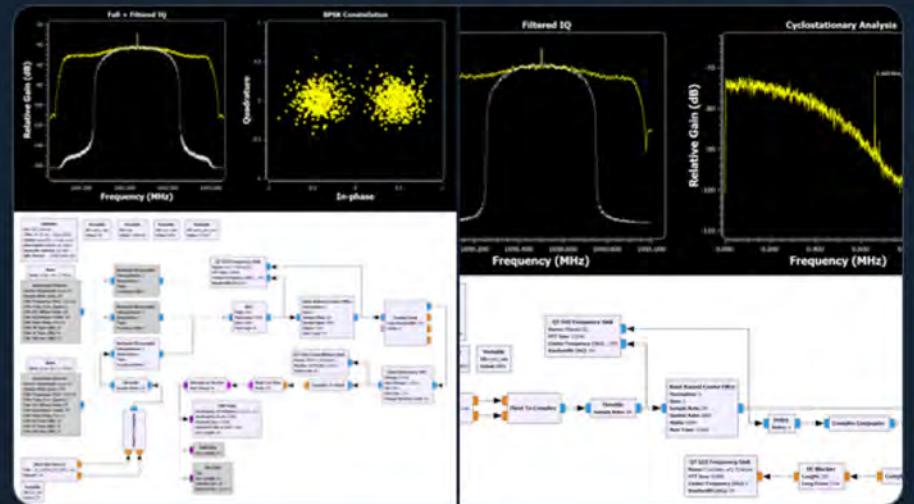
A Long March 3A lifts off June 6 from Xichang Satellite Launch Centre with Fengyun-2H weather satellite. Credit: CASC

HELSINKI, Finland – China on Tuesday launched the Fengyun-2H weather satellite, successfully inserting the near 1.4-metric-ton spacecraft into a geostationary-transfer orbit.



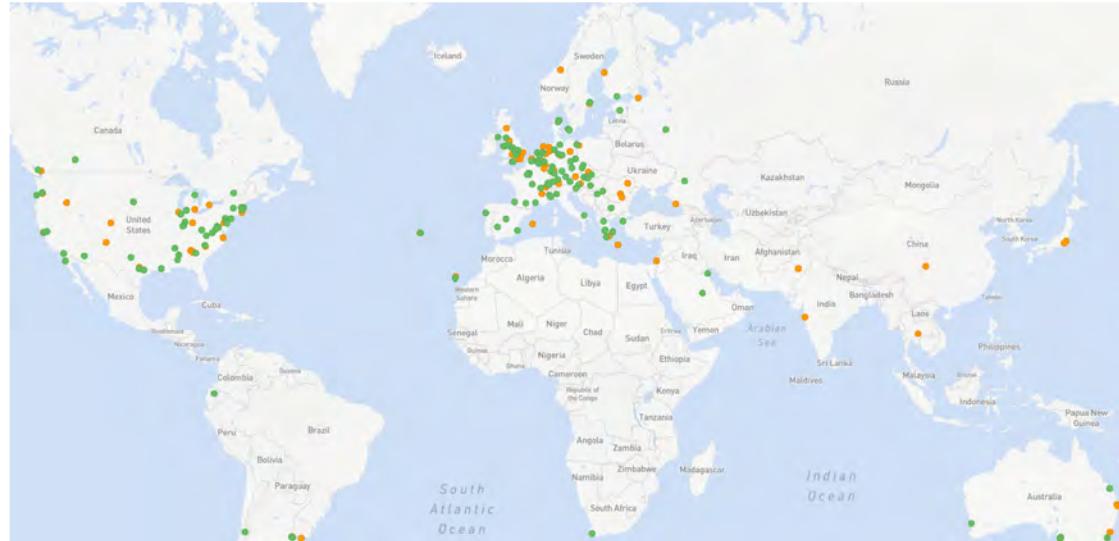
Sam
@sam210723

Demodulating LRIT downlink from FENGYUN-2H on 1690.5MHz (660 kSps BPSK). Hard to find documentation for this service.
Thanks to @HegedsT48137034 for the IQ recordings.



6:33 AM · Jul 27, 2019 · Twitter Web App

SatNOGS Continues to be Amazing



[Credit: cshields](#)

- ESA uses gpredict & gqrx at their cubesat groundstation!
- ESA: “Perhaps some of you know this software?”
- Alexandru Csete: “Yes, I wrote it.”

Alexandru Csete
@csete

They use gpredict and gqrx at the ESA/ESAC cubesat groundstation 😊



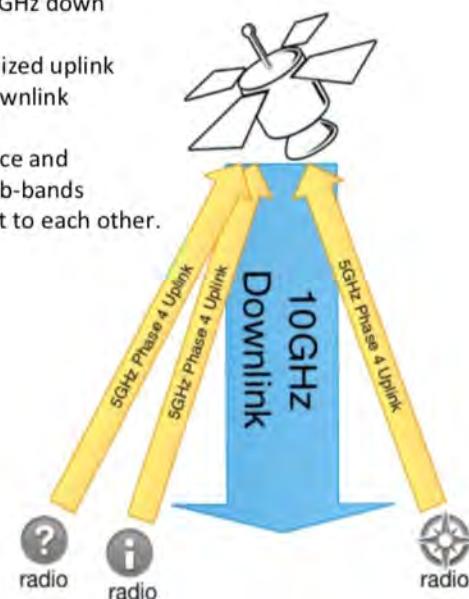
9:30 AM · Sep 24, 2018 · Twitter for Android

Phase 4 Space & Ground

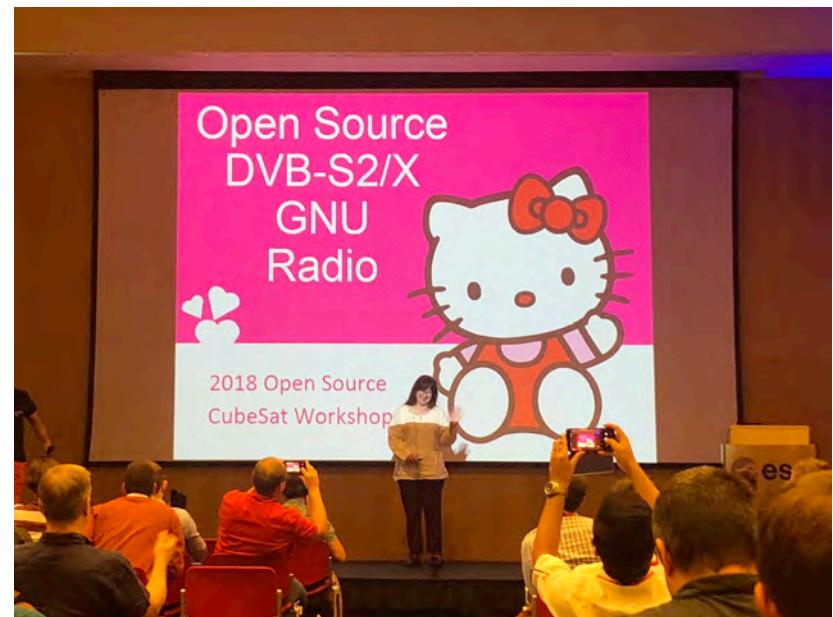
5.645-5.655 GHz up
10.45-10.46 GHz down

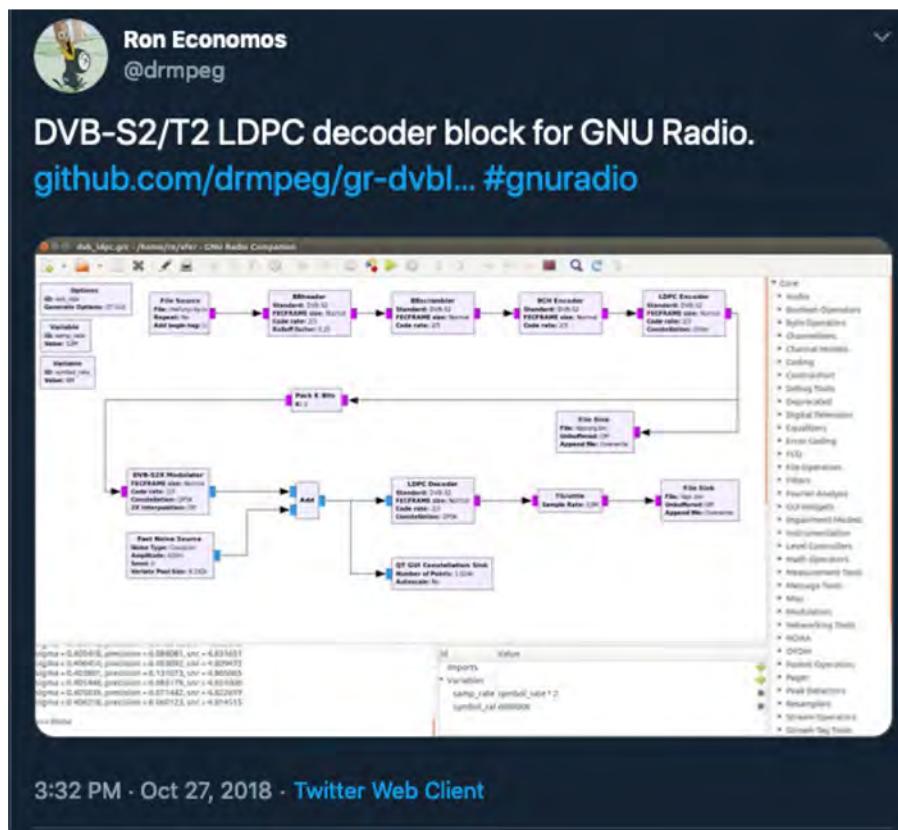
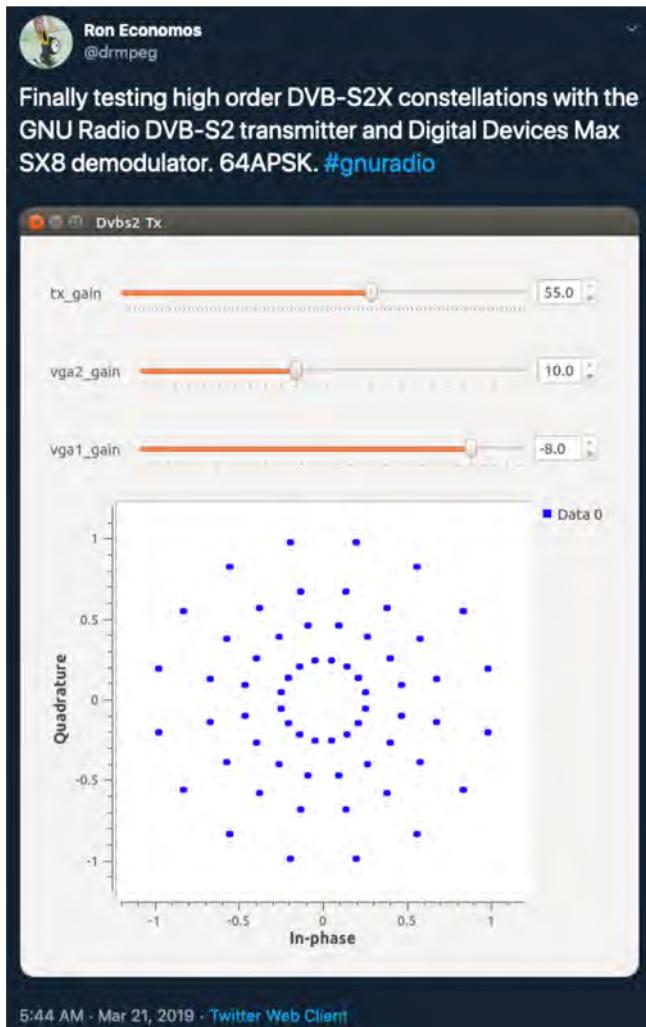
MSK channelized uplink
DVB-S2/X downlink

Amateur space and
terrestrial sub-bands
are right next to each other.



Phase 4 Ground radios





Hacking TVs with Ron's Tools

≡ WIRED

BUSINESS CULTURE GEAR IDEAS SCIENCE SECURITY TRANSPORTATION

Watch a Drone Take Over a Nearby Smart TV

Smart TVs continue to look dumber by the day.





Quetzal-1 CubeSat
@quetzal1_uvg

This little mess works the magic. We're using #HackRF and @gnuradio to transmit and receive

#cubesat #guatevaalespacio #quetzal1



1:07 AM · Aug 28, 2019 · Twitter Web App

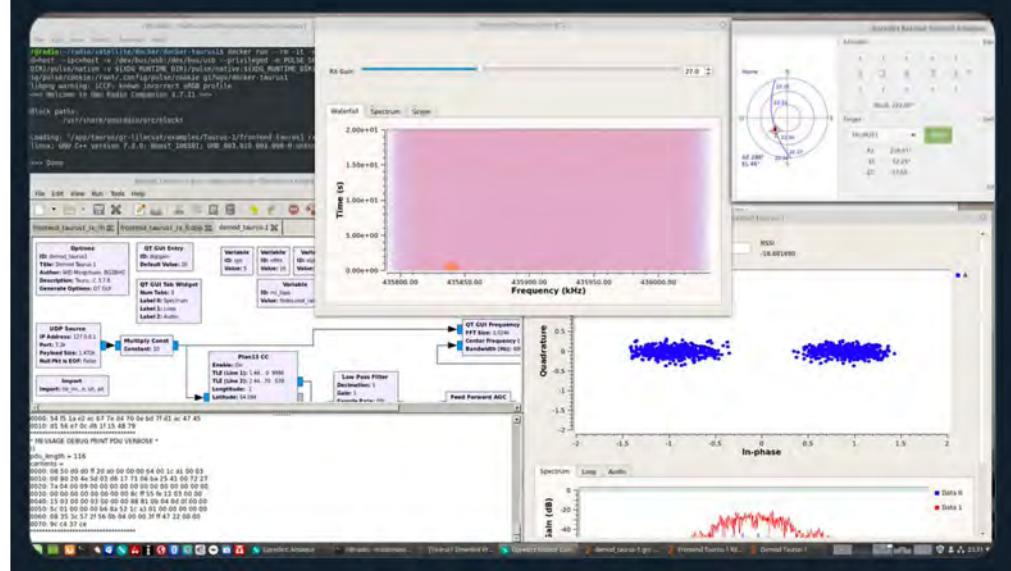
 **GNURadio**
THE FREE & OPEN SOFTWARE RADIO ECOSYSTEM

Credit: [@quetzal1_uvg](#)



John GI7UGV
@gi7ugv

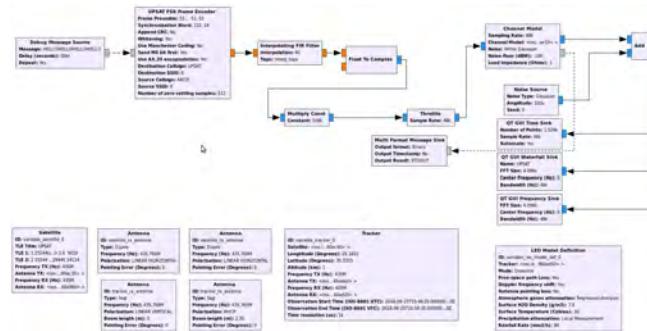
Taurus-1 telemetry using modified gr-lilacsat with an RTL-SDR is running fine in a Docker container as it was with Lilacsat-1. Needs some abuse to get the USB and audio through but might be able to do that over network instead. Fingers crossed for voice transponder.



Credit: John GI7UGV

SATCOM Channel Simulator

- Developed as part of SDR Maker Space, a joint ESA & LibreSpace initiative



Libre Space

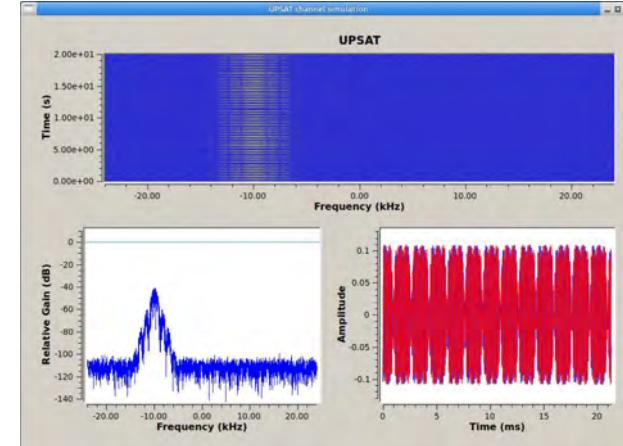
Gr-leo: A GNU Radio space channel simulator

SatNOGS Software



Hello everyone,

The last three months I've been working on gr-leo, a GNU Radio project that aims to provide blocks for the simulation of the telecommunication channel between an orbiting satellite and a ground station.



[Screenshots: @csete](#)

 **David Maynor**
@Dave_Maynor

And it's running GNUradio and GQRX with a RTLSDR just fine. And it's tiny!

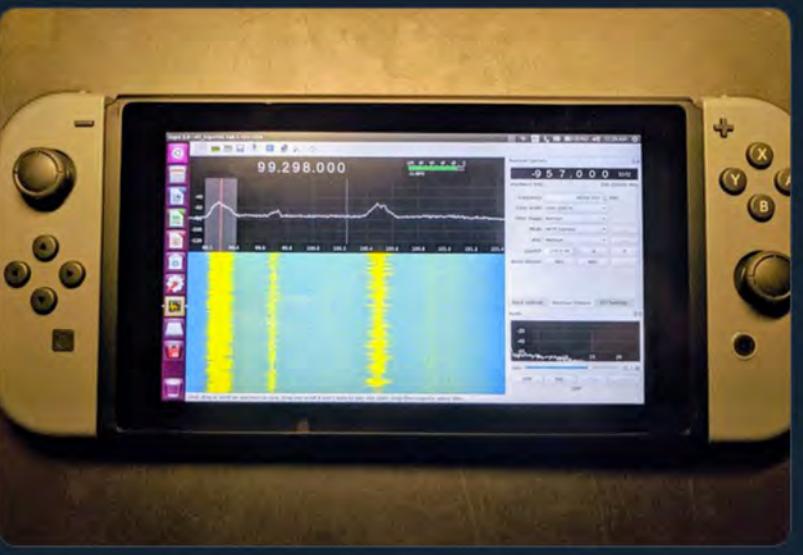


6:32 PM · Apr 11, 2019 · [Twitter for iPhone](#)

[Credit: @Dave_Maynor](#)

 **/ spek-t(r)ä-fä-gas /**
@spectrophagus

#GQRX accessing a networked @rtlsdrblog v3 dongle at 2.4Msps over 802.11a, from Ubuntu 18.04 #L4T on #NintendoSwitch ... no luck with gr-fosphor yet. #SDR #portable #tegra #fuseegelee



12:34 AM · Jun 16, 2019 · [Twitter for Android](#)

[Credit: @spectrophagus](#)



Credit: [@HollyGraceful](#)

INFOSEC TOPICS CERTIFICATIONS CYBERSECURITY CAREERS EVENTS CONTRIBUTORS ABOUT INFOSEC

IoT Radio Communication Attack - Part Three

RTL-SDR Source

Sample Rate (spw): 1.6M

Ch0: Frequency

Ch0: JUMP TO

Ch0: DC Offset Mode

Ch0: ID Balance Mode

Ch0: Gain Mode

Ch0: Corr. (ppm)

Ch0: DC Offset Mode

SELECT POST SECTION

Device Arguments

Sync: don't sync

Num Adboards: 1

Http Time Source: Default

Num Channels: 1

Sample Rate (spw):

Ch0: Frequency (Hz):

Ch0: Freq. Corr. (ppm):

Ch0: DC Offset Mode:

Social sharing buttons: Tweet, LinkedIn, Facebook, Like, Reddit

MOTHERBOARD
TECH BY VICE

With \$20 of Gear from Amazon, Nearly Anyone Can Make This IMSI-Catcher in 30 Minutes

Surveillance takes on different character when it trickles down to more ordinary, everyday users. The significance and threat from IMSI-catchers is multiplied when a lot more people can deploy one using cheap tech from Amazon and free code from Github.

By Joseph Cox

Nov 16 2018, 9:00am  Share  Tweet

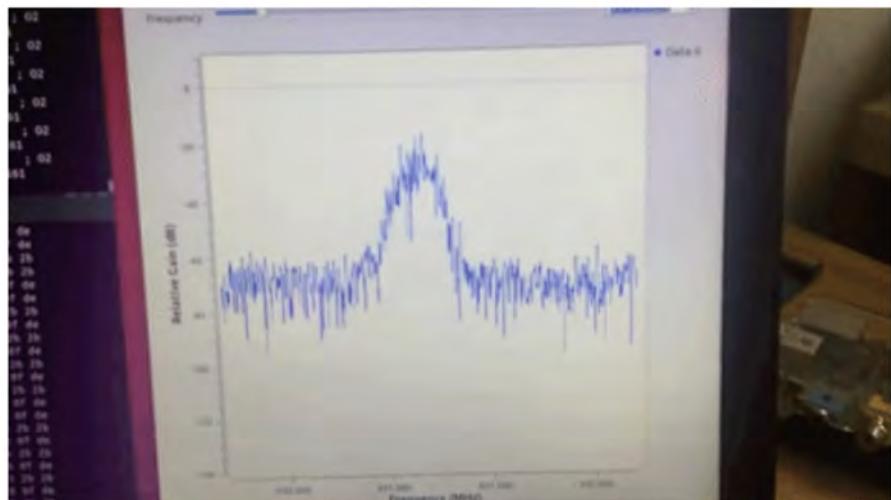
The gr-gsm project

The *gr-gsm* project is based on the *gsm-receiver* written by Piotr Krysik (also the main author of *gr-gsm*) for the *Airprobe* project.

The aim is to provide set of tools for receiving information transmitted by GSM equipment/devices.

boingboing / CORY DOCTOROW / 6:55 AM FRI

For \$20, you can make a DIY Stingray in minutes, using parts from Amazon





SERVIC

BSides Munich 2019 Recap



Between the 24th and 25th of March I participated in the BSides Conference and Workshops, this piece presents a short recapitulation of what I saw, learned and liked about the event.

My journey started in the middle of January when I filled out the call for papers and workshops. The goal present a **one day workshop** to give back to the security community and test some **new hands-on exercises and slides on wireless hacking**. About one month later I received a friendly acceptance email.



The screenshot shows the Black Hat USA 2019 website. At the top right, there's a "REGISTER NOW" button. Below it, the text "AUGUST 3-8, 2019" and "MANDALAY BAY / LAS VEGAS". The main navigation menu includes ATTEND, TRAININGS, BRIEFINGS, ARSENAL, FEATURES, SCHEDULE, BUSINESS HALL, SPONSORS, and PROPOSALS. On the left, there's a "SEE ALL SPEAKERS" link. In the center, there's a "SPEAKER" section for "PAUL CLARK, FACTORIA LABS, LLC". It includes a small profile picture of a person wearing a hat, a brief bio, and a link to his profile.



The screenshot shows the Attify Store product page for "SDR for Pentesters". It features a large image of a black SDR device with multiple ports and connectors. Below the image, the product name "SDR for Pentesters" is displayed in bold red text.

SDR for Pentesters

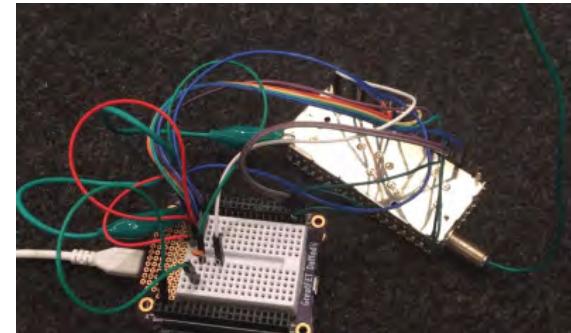


[Course by: Bastian Bloessl](#)



The screenshot shows the Hackaday homepage with a navigation bar at the top featuring links for HOME, BLOG, HACKADAY.IO, TINDIE, HACKADAY PRIZE, SUBMIT, and ABOUT. A skull and wrenches logo is in the top left. Below the navigation is a large title 'HACKADAY'. Underneath is a section for the article 'RADIO GETS RIDICULOUS' by Al Williams, dated December 21, 2018, with 16 comments. The article image shows a man pointing at a large screen displaying a spectrum analysis graph. The screen is labeled 'Supplyframe' and 'VNA samples'. The Hackaday Supercon logo is visible at the bottom of the stage.

- Domonic Spill's "Ridiculous Radios" – building SDRs out of random parts.
<https://hackaday.com/2018/12/21/radio-gets-ridiculous/>



SDR made from an old VCR

Educational Curriculum



Uni Stuttgart NAV
@UniStuttgartNAV

Replying to @astrojockey and @rtlsdrblog

Yes. We started phasing in #SDR and #gnuradio in some of our bachelor and master courses and will make that a fundamental part when we switch to the new master program, which is expected to start in fall 2020.

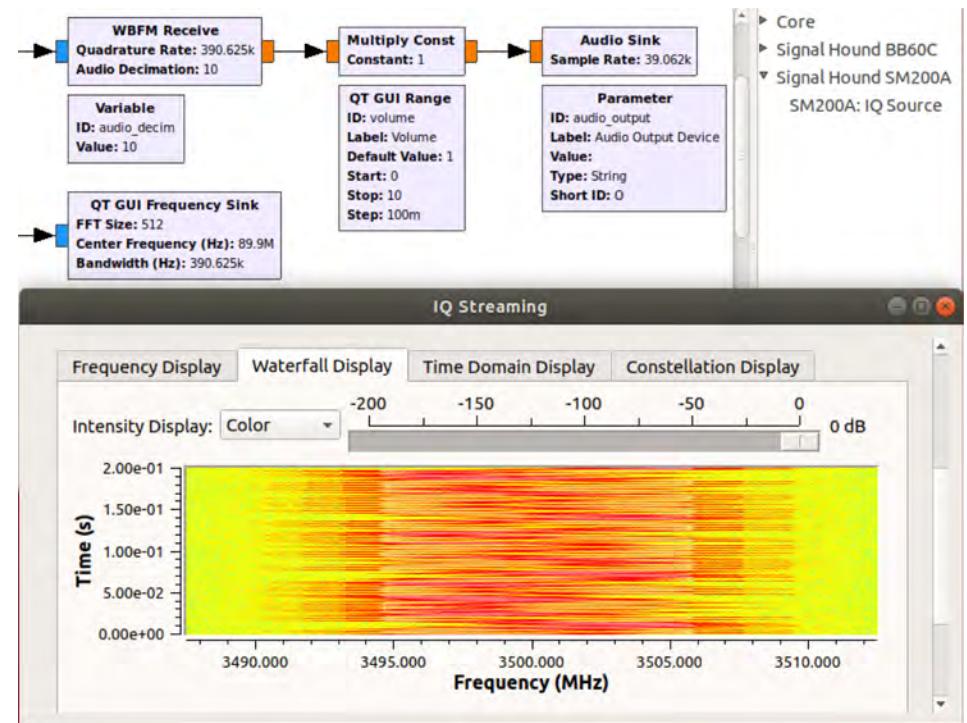
1:35 AM · Jul 17, 2019 · Twitter Web Client

HW Support

- Signal Hound announced GNU Radio modules for some of their spectrum analyzers in early 2019!

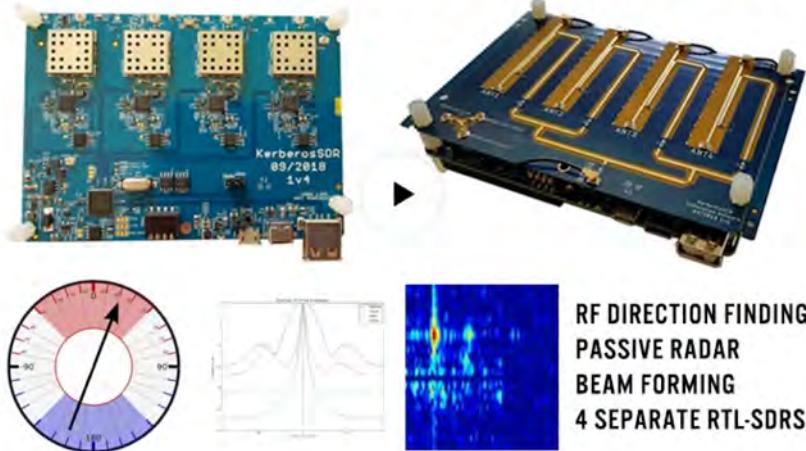
Signal Hound Announces Availability of GNU Radio modules for the SM200A and BB60C Spectrum Analyzers

Use Signal Hound analyzers as I/Q sources or blocks within the open source GNU Radio application

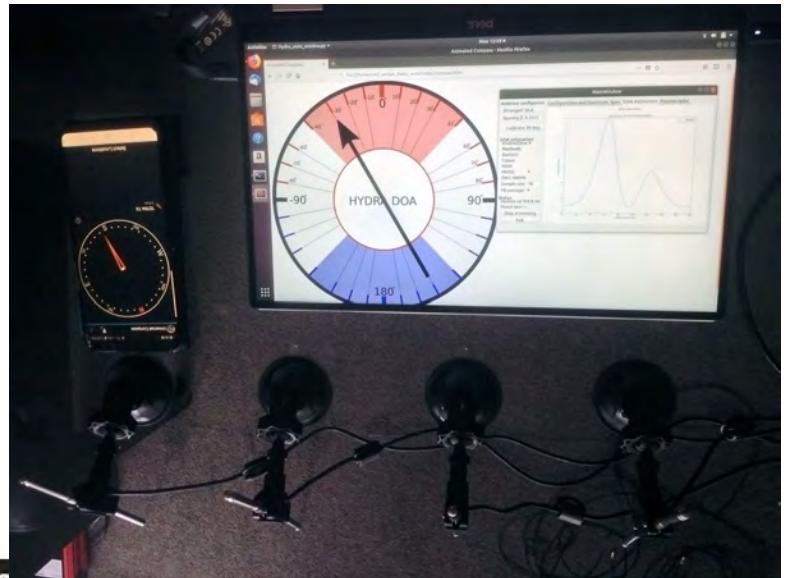
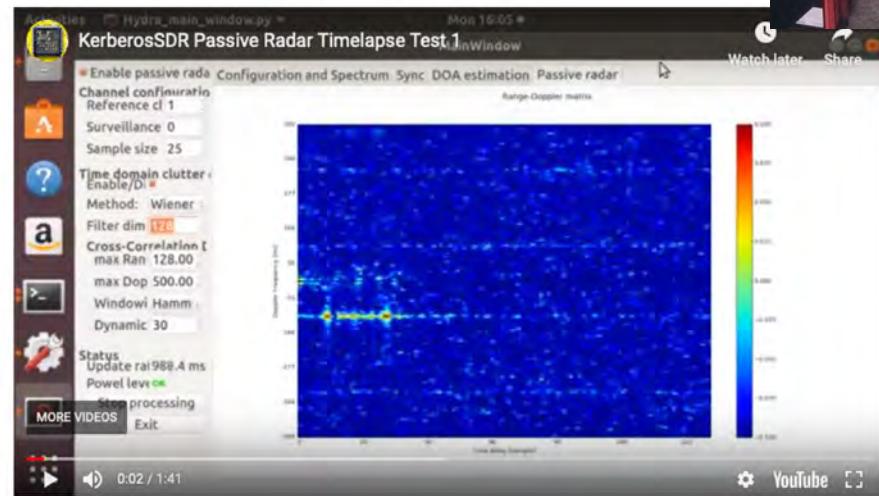


[Credit: Signal Hound](#)

KERBEROSSDR: 4X COHERENT RTL-SDR



RF DIRECTION FINDING
PASSIVE RADAR
BEAM FORMING
4 SEPARATE RTL-SDRS



- ADI's gr-iio on-track for upstreaming into GNU Radio
- Use Linux kernel's "Industrial I/O" module for data movement!
- Currently going through GREP process.
- Get involved!
 - <https://github.com/gnuradio/greps/blob/master/grep-0017-iio.md>



RTL-SDR (RTL2832U) and software defined radio news and projects. Also featuring Airspy, HackRF, FCD, SDRplay and more.

JULY 8, 2019

KIWISDR CONFERENCE TALKS: KIWISDR AND IT'S GPSDO, TDOA GEO-LOCATION AND GNURADIO SOURCES

Thank you to John ZL/KF6VO (creator of the KiwiSDR) for submitting some interesting KiwiSDR related conference talks that might be of interest to some readers. If you were unaware [the KiwiSDR](#) is a US\$299 HF SDR that can monitor the entire 0 - 30 MHz band at once. It is designed to be web-based and shared, meaning that the KiwiSDR owner, or anyone that they've given access to can tune and listen to it via a web browser over the Internet. Many public KiwiSDRs can be found and browsed from the list at [sdr.hu](#) or by signal strength and location [on this website](#). One of the most interesting KiwiSDR features is it's [TDoA capabilities](#), which allow users to geographically locate HF transmitters.



Seeedstudio KiwiSDR Kit Software Defined Radio with BeagleBone Green

by [seeed studio](#)

7 customer reviews

[Amazon's Choice](#) for "kiwisd़r"

Price: **\$299.00** & FREE Returns

Pay **\$24.92/month for 12 months, interest-free with your Amazon Prime Rewards Visa Card**

- SDR covers the 10 kHz to 30 MHz (VLF-HF) spectrum.
- Web interface based on OpenWebRX from András Retzler, HA7ILM.
- Demodulation modes: AM, AMN, LSB, USB, CW, CWN, NBFM.
- RF antenna connector: SMA and terminal block.
- GPS receives the Navstar system on L1 frequency 1575.42 MHz.

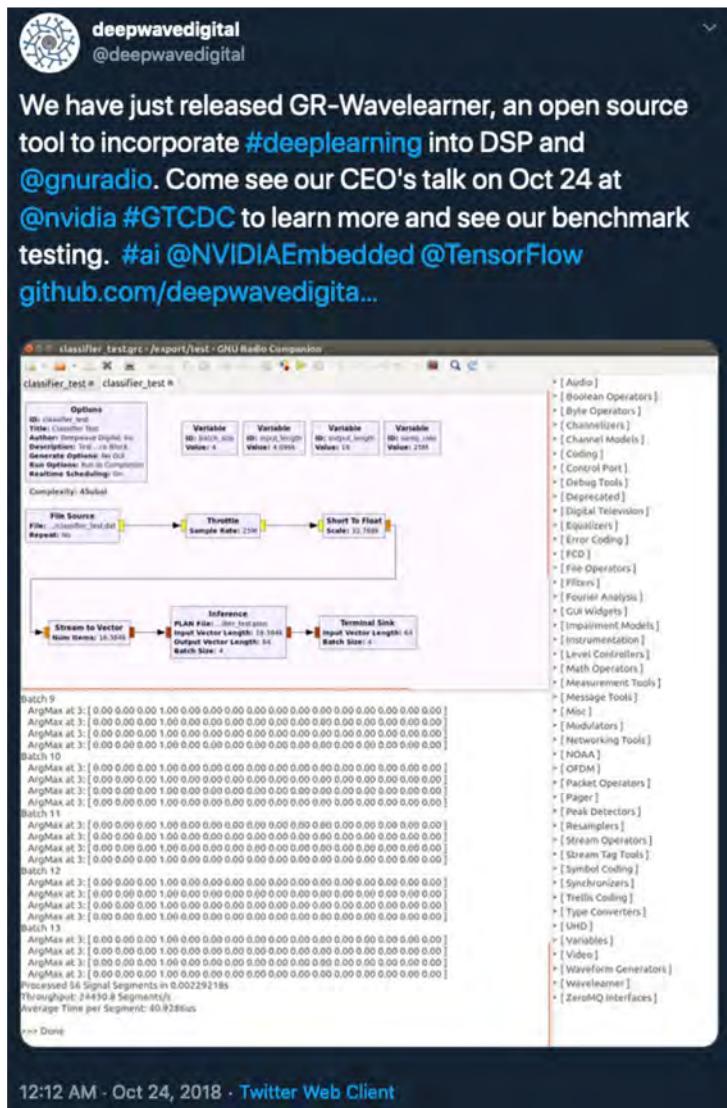
New (2) from \$299.00

Report incorrect product information.

- Deepwave's gr-wavelearner
 - Provides a GNU Radio interface for NVIDIA's TensorRT

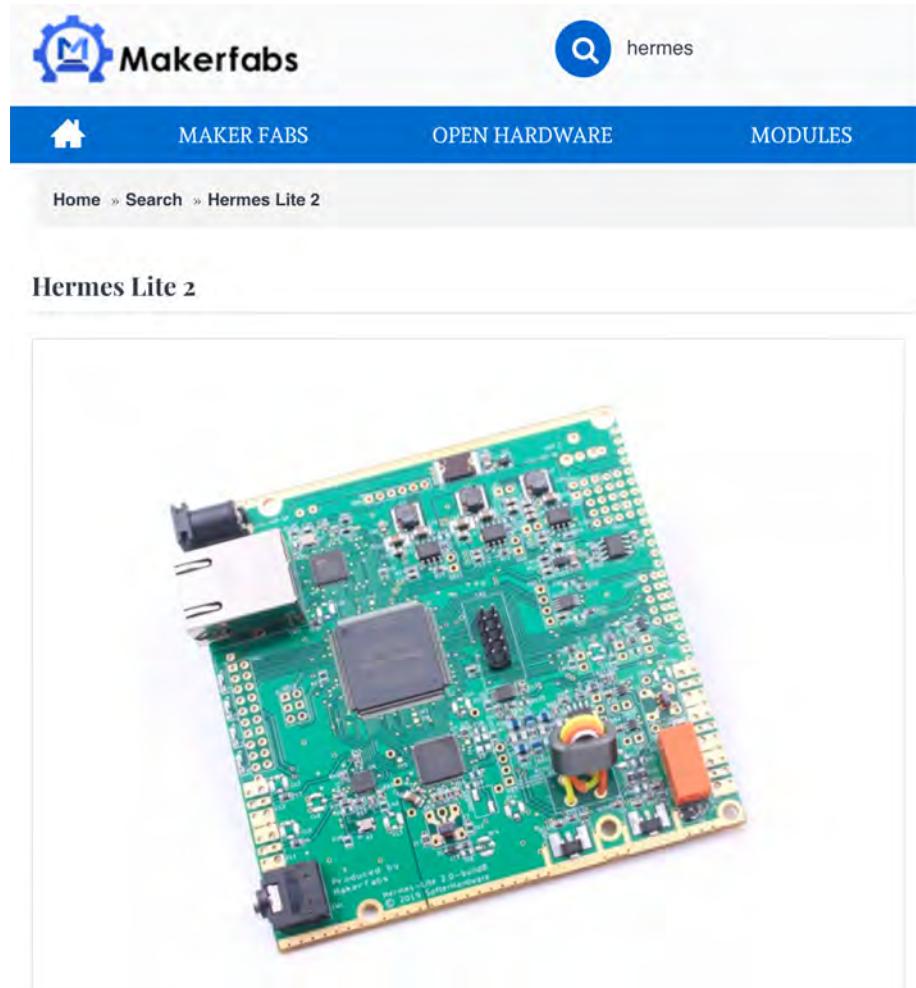
Artificial Intelligence Radio Transceiver (AIR-T)

The first radio frequency system designed for deep learning



Hermes Lite 2

- Original Hermes board uses gr-hpsdr
 - Open source HW design
 - Intended to be a low-cost HF design
-
- Uses an AD9866 to keep costs low.



TujaSDR – SDR for RPi

TUJA SDR TRANSCEIVER



<http://tujasdr.com/>

VOLK & SigMF

 Albin   
@albinstigo

volk_32fc_s32f_power_spectrum_32f got 4.5x faster on
@Raspberry_Pi, @gnuradio.



Adds neonv7 for volk_32fc_s32f_power_spectrum_32f by as...
RUN_VOLK_TESTS:
volk_32fc_s32f_power_spectrum_32f(131071,1) neon ...
[🔗 github.com](#)

10:00 AM · Aug 11, 2019 · Twitter Web App

 Albin   
@albinstigo

Good progress today towards NEON SIMD completeness
in @gnuradio's vector library libvolk. One important kernel
got a 14x speedup on @Raspberry_Pi 3b.

Follow my progress [github.com/gnuradio/volk/...](https://github.com/gnuradio/volk/)

@Arm #sdr #hamradio



Missing NEON implementations · Issue #243 · gnuradio/volk
Here's a list of kernels missing NEON implementations. Some
of these are easy, some are hard, some would not provide ...
[🔗 github.com](#)

1:07 PM · May 1, 2019 · Twitter for Android

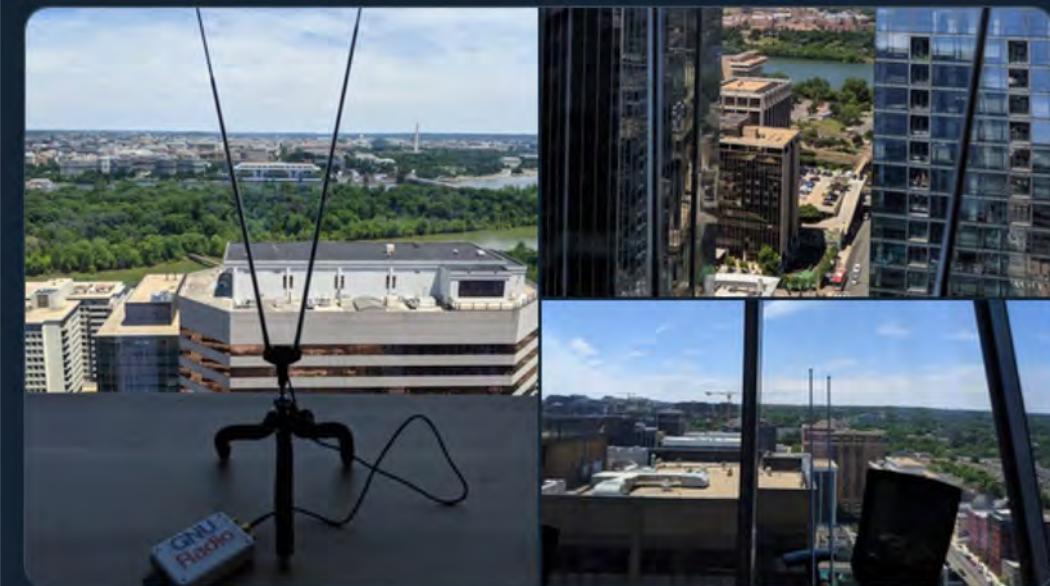
SigMF Expansion

- Substantial adoption over last year.
 - (Most of it silent)
- Spent full hackfest week working on SigMF design
- Will be a split, one branch backwards-compatible in “maintenance” mode, another pushing into new features
 - How do you record data such that another computer can process it without human intervention?
- SigMF talk on Wednesday



Ben Hilburn
@bhilburn

Get your SigMF recordings, here! Come get your SigMF recordings! [@gnuradio](#)



2:20 PM · Jun 12, 2019 · [Twitter for Android](#)

 UC Berkeley SETI ⚡
@BerkeleySETI

Replies to @bhilburn and @gnuradio

Get your SigMF recordings, here! Come get your SigMF recordings! =)

@gnuradio @GreenBankObservatory @TheDishParkes
@mwaterlescope @SETIIInstitute @jodrellbank



MeerKAT, South Africa

GBT, USA

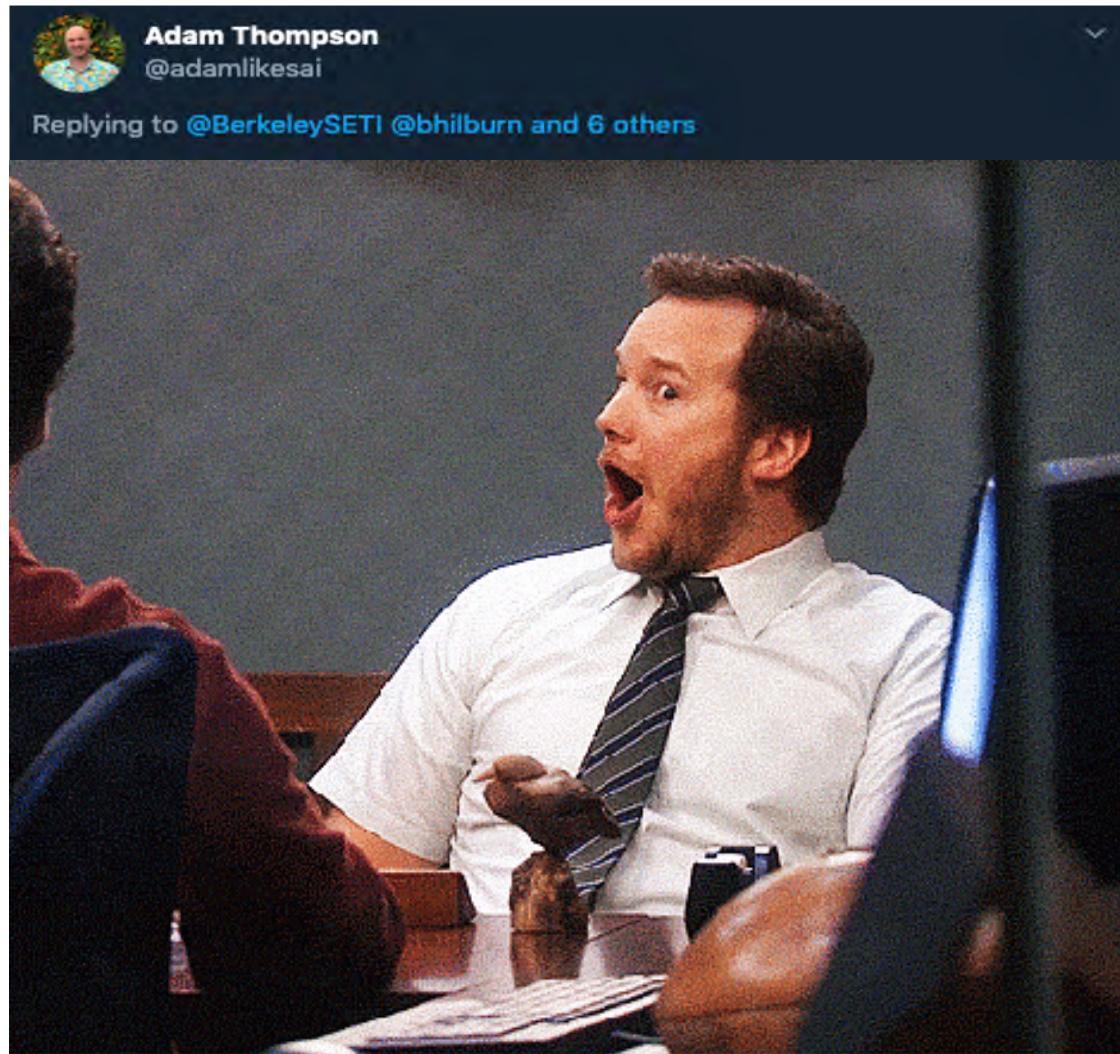
Parkes, Australia

Allen Telescope Array, USA

MWA, Australia

Jodrell Bank, UK

10:13 PM · Jun 12, 2019 · Twitter Web Client

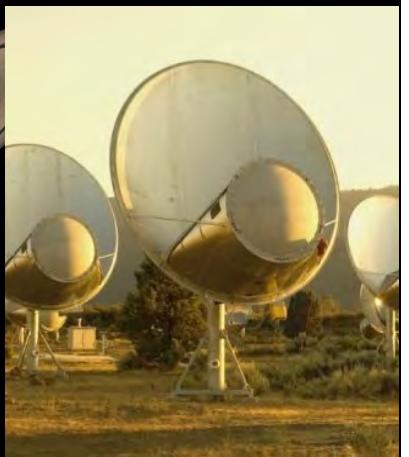
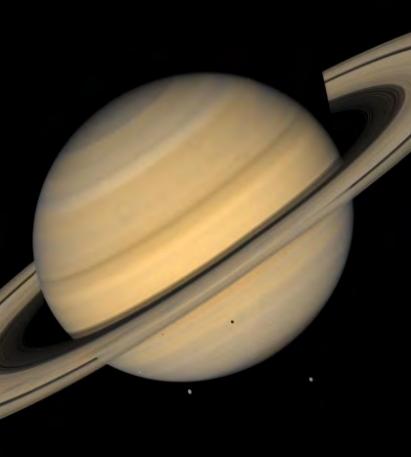


GNU Radio and The SETI Institute

- The SETI Institute is Co-Sponsoring GRCon20!
- Collaboration between GNU Radio and the SETI Institute has ramped up extensively over the last year
- Expect to see a lot more here in the near future!



SETI Institute Research



Nathalie Cabrol
SETI NAI Team
NASA Funded

Dale Anderson
Antarctic Astrobiology
Privately Funded

Doug Caldwell
Data Pipeline for
Kepler & K2 Mission
NASA Funded

Mark Showalter
Rings and Moons node
for PDS
NASA Funded

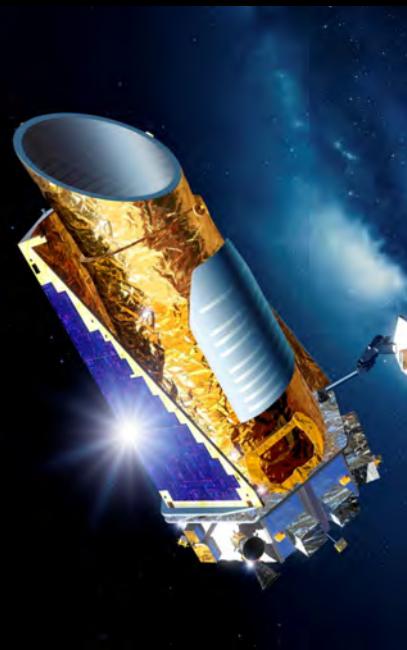
Andrew Siemion
Radio and Optical
SETI
Privately Funded

Research Partner on NASA Missions

CASSINI



Kepler / K2



NEW HORIZONS



OSIRIS REx



BREAKTHROUGH LISTEN



Automated Planet Finder
(Lick Observatory, CA)



Green Bank Telescope
(Green Bank, WV)



Parkes Telescope
(New South Wales, Australia)



MeerKAT Telescope
(South Africa)



VERITAS
(Mt. Hopkins Arizona)



MWA
(Western Australia)



FAST
(Southern China)

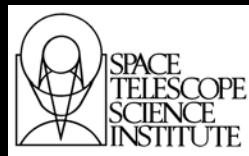


Jodrell Bank Observatory
(United Kingdom)

Funding Sources, Collaborators, Partners



Google Cloud



GRCon



Huge Thanks to the GRCon19 Team



Michelle Thompson



Steve Conklin



Derek Kozel



Neel Pandeya



Samantha Palazzolo



Tathagata Mukherjee

GRCon 2020

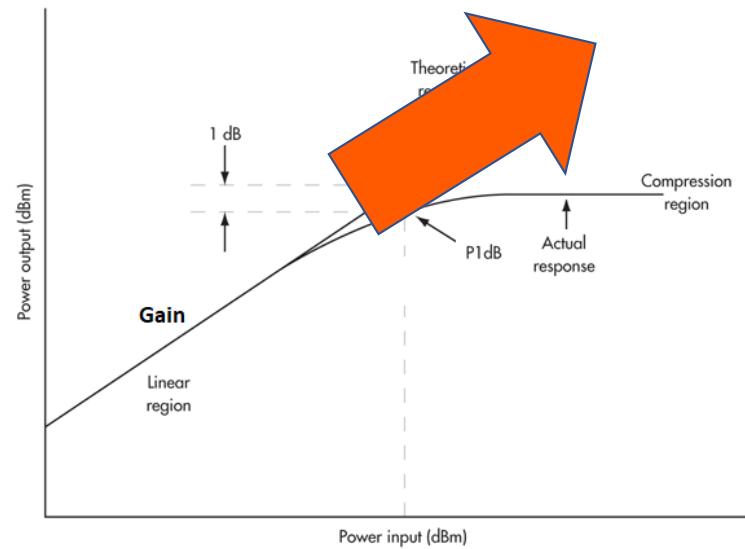
- GRCon is (almost definitely) headed to Charlotte, NC!
- If you are interested in getting involved, please get in touch!
 - You can help as your own time allows.
- grcon@gnuradio.org



Project Direction

2017: “Have we hit P1dB?”

- Answer: very definitely “***Nope!***”
- If anything, growth has accelerated.
- The GNU Radio ecosystem has a tremendous footprint
 - We only see a small part of everything happening.



2018: “How do we address sustainability?”

- Over the last year, a lot of very good things have happened here.
- Several key sponsors have stepped forward.
- We have ideas in the pipeline for revenue-generating programs, with input & advice from current sponsors.
- Working on a more stable organizational solution.

2019: The Next 20 Years

- GNU Radio started in 2001
- The existing runtime has lasted two decades.
 - That is incredible.
- I think it's time for us to start thinking about what comes next.
 - What is the scheduler & runtime that will last us the next 20?

GNU Radio 4.0

- It's clear the future is heterogeneous and parallel, and machine learning will play a significant role
 - Also - Developer experience, instrumentation & debug, dependency management, modularity, etc.,
- This is a substantial undertaking, and will require years of effort from a strong and well-supported team.
- Current stage: Organization and planning.
 - What do we need to know?

SDR Office Hours

- Discussing the idea of GNU Radio developers offering “office hours” or “mentoring” in some form.
- Running a survey to gauge interest and gather feedback
- If you think you might be interested in either being a mentee or mentor, please fill out the survey!
- <https://bit.ly/2ISEUrZ>

Open Source Licensing Talk!

- Usually an hour long workshop, this year it's a talk.
- Please take my survey! It'll be fun!
- <https://bit.ly/2lWTGxK>

Questions?