# *Rinexmod & Autorino:*
# Two Tools to Enable multi-GNSS and Near Real-time Data Acquisition and Pre-processing

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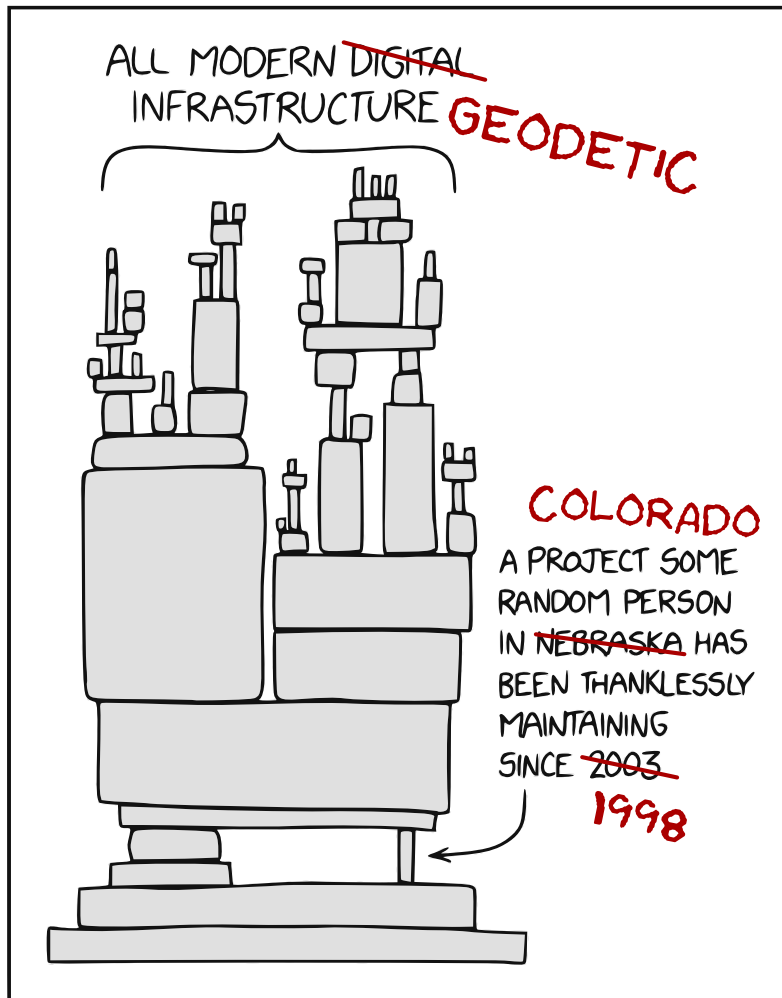
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**IGS 2024 Workshop and Symposium, 1 - 5 July in 2024, Bern, Switzerland**

IPGP OVS

IGS INTERNATIONAL GNSS SERVICE

cnrs Université Paris Cité

# two major evolutions in GNSS geodesy over the past years



ALL MODERN ~~DIGITAL~~ INFRASTRUCTURE *GEODETIC*

COLORADO

A PROJECT SOME RANDOM PERSON IN ~~NEBRASKA~~ HAS BEEN THANKLESSLY MAINTAINING SINCE ~~2003~~ *1998*

*Freely inspired by*
*XKCD #2347, R. Munroe*

- **New constellations reach maturity**
  - Galileo in 2016, Beidou in 2018, 1st GPS Block III in 2018
  - ⇒ Increasing number of observations and new signals, rendering obsolete the RINEX2 format, dating back to 1993 (!)

- **The end of teqc development in 2019**
  - The "Swiss army knife" of data conversion and quality control
  - Widely used until now by the community
  - Delayed switchover to RINEX3
  - ⇒ Need to turn to OEM converters (one per manufacturer)

# Needs for IPGP's volcano. and seismo. observatories (OVS)

- Challenging situation for local and campaign-based network operators.

- Needs of unified download/processing chain for the 3 IPGP's OVS, i.e. 85 GNSS stations

- Able to handle heterogeneous networks, comprising different generations of receivers from multiple manufacturers.

- Be as teqc-free as possible:
  - For header editing
  - Convert raw data to RINEX3



Guadeloupe (GLP)

Martinique (MTQ)

La Réunion (REU)

Mayotte (MYT)
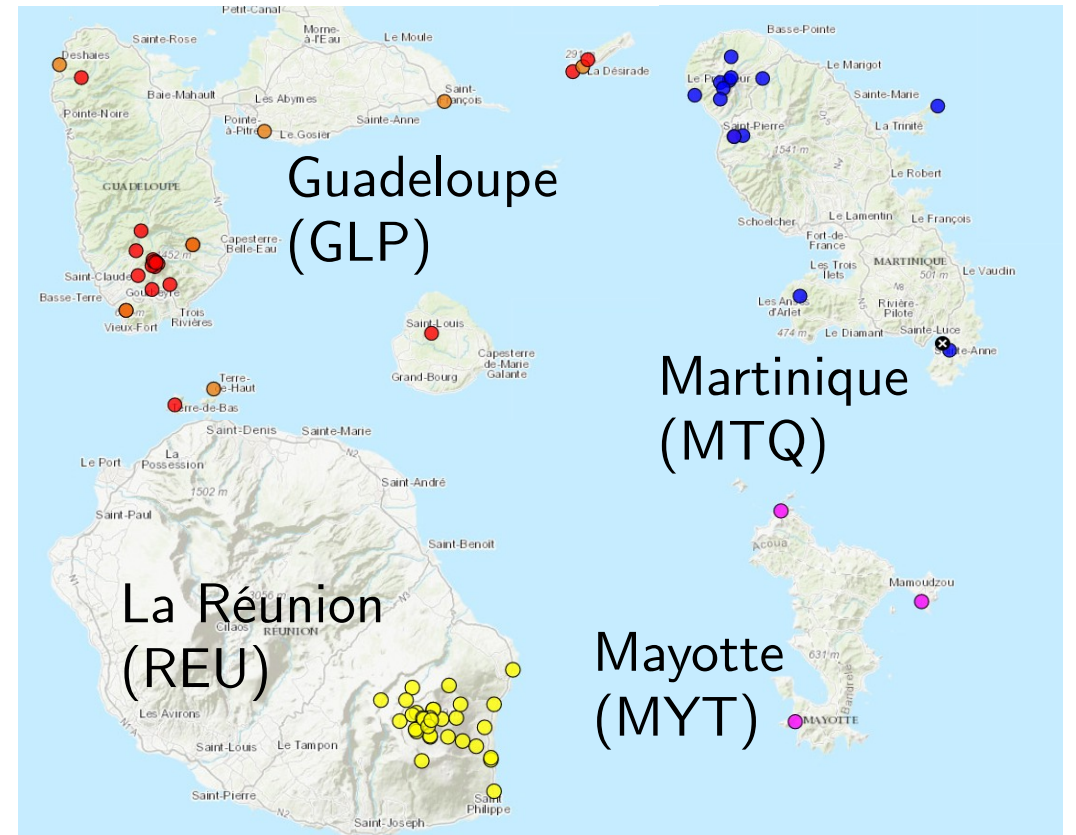
# rinexmod

- *rinexmod* is a tool for batch-editing the headers of GNSS data files in RINEX format, and for renaming them correctly.

- Supports :
  - RINEX versions 2 and 3/4,
  - short and long naming conventions,
  - Hatanaka compression.

- developed in python3

- can be run from the command line; or in API mode, by calling a frontend function or *RinexFile* objects.

- Metadata can be taken from a sitelogs file, GAMIT's station.info (for campaign-mode users) entered manually. (GeodesyML coming soon!)

*rinexmod* is freely downloadable and usable under GNU GPLv3 licence

https://github.com/IPGP/rinexmod

# autorino

*Assisted Unloading, Treatment and Organization of RINEX Observations*

- Centralizes GNSS data **download**, **conversion** and **pre-processing** operations
- Control of actions to be performed for each station from a standardized yaml config. file
- Common interface to run OEM converters seamlessly and uniformly to RINEX3

| Manufacturer | Converter |
|---|---|
| Trimble | Docker `trm2rinex` |
| Trimble | `t0xConvert` (*when released??*) |
| Septentrio | `sbf2rin` |
| Leica | `mdb2rinex` |
| Topcon | `tps2rin` |
| Universal | `teqc` (« legacy mode ») |
| BINEX | `convbin` (RTKLIB module) |

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https://github.com/IPGP/autorino
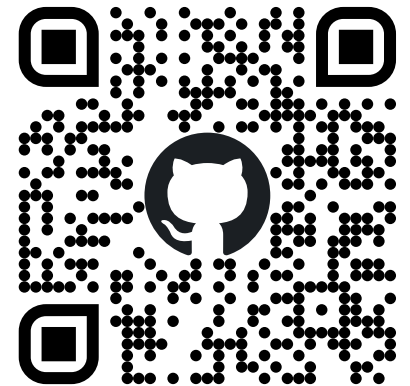
# For more information

- Poster in Main Hall for more details and extended discussion (P1:001)

- Practial/operational demonstration possible during the week

https://github.com/IPGP/rinexmod

https://github.com/IPGP/autorino