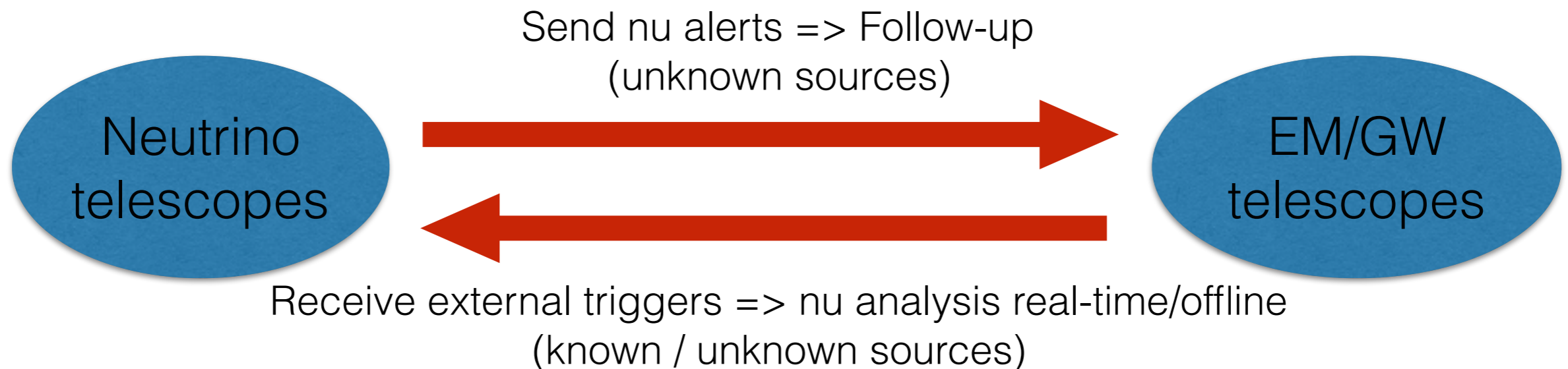


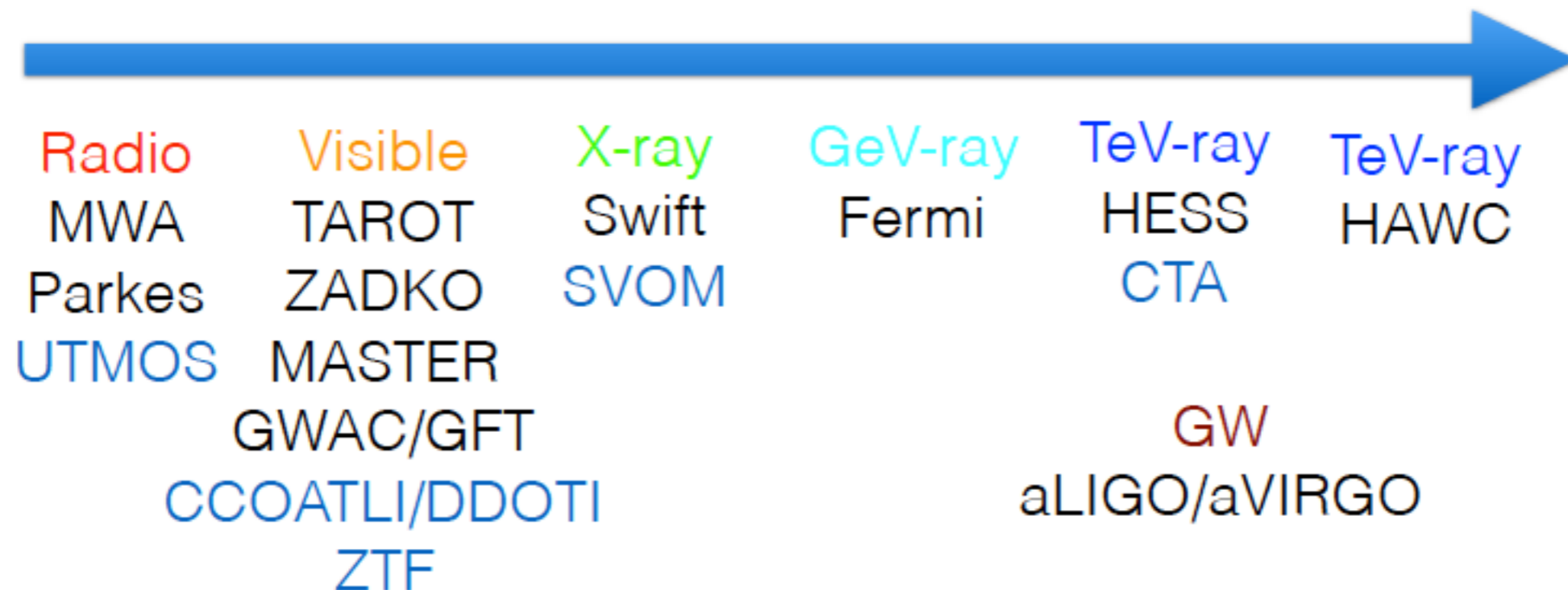
Open points

- **Sources of neutrinos unknown: galactic / extragalactic, dark sources, new categories...**
 - => Hadronic/neutrino models are not very developed especially in intermediate energy range [50GeV-50TeV]. Very few attempt to have lepto-hadronic models.
 - => Even if no source detected, strong constrains on the baryonic load.
 - => Need more support from the phemeno/theorist communities [Next big challenge in astroparticle to identify the CR sources]
- **It is “relatively” easy to detect cosmic neutrinos but neutrino telescopes are background-dominated experiments.** By itself, to have a discovery of a source, need to have a large number of neutrinos accumulated in a given direction. But the sources are quite faint. For us, challenge is to keep offline performances online.
 - => KM3NeT/ARCA, IceCube: ~200-300 atmospheric muon neutrinos per day. Cosmic neutrinos: 10-30 per year.
 - => Multi-messenger can help to reduce the discovery potential to 1-2 neutrinos per source.



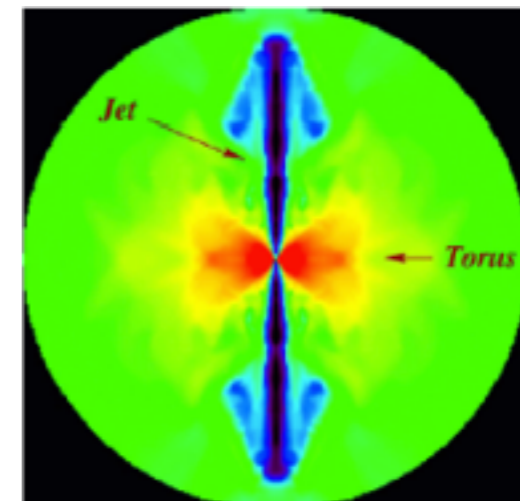
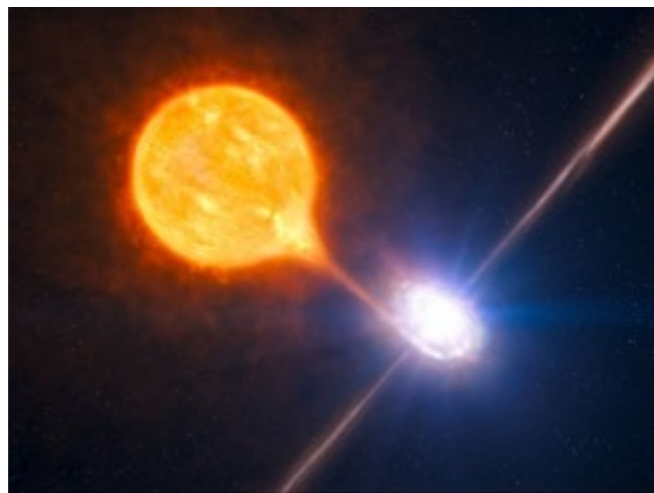
Open points

- **Follow-up of neutrino alerts:** need to have access to a large diversity of EM telescopes from radio, visible to X-ray, high-energy gamma-ray located all-around the world. Up to now, there is no coordination and ANTARES, IC, KM3NeT are signing agreement to his own network. For specific cases, alerts are made public.
 - => Tentative with AMON but it is stil not very efficient (US-centered)
 - => IC/ANTARES have found no sources: adapt follow-up strategies ? single high-energy neutrino, predefined neutrino direction, multiplet...
 - => New windows: cascade events but need to have access to large FOV experiments (2-3 deg FOV)
 - => Dissemination of neutrino alerts: public / private / a la LVC ? Is private GCN useful for the community ?
 - => Format: always try to use the simplest solution (GCN socket, mail, VO) ?



Open points

- **Real-time/offline neutrino analysis:** Most of the potential sources are transient/variable sources: GRB, cc-SN, FRB, AGN, XRB... Most of the sources are variable. Up to now. Dissemination of alerts not very efficient, complete. With the new instruments (SKA, LSST...), how the transients will be reported in real-time? with classification ?
 - => Very well organized for GRB, SGR... with the GCN
 - => For high-energy sources (galactic binaries, flares of AGN...), report in atels difficult to automatically analyzed, not very consistent...
 - => Optical/radio transients, very difficult access for us



Open points

- **Detection of MeV neutrino signal:** in 2020, IceCube, KM3NeT and JUNO + SK will have the potential to detect neutrinos from SN up to distances of few 100 kpc ($> 1\text{Mpc}$, TBC). Possibility to reconstruct the energy spectrum and detailed LC. Working hard on the estimation of the direction (elastic scattering interaction, neutrino telescope interferometer...)
=> No real inter-organization in this community
=> Dissemination of neutrino alerts via SNEWS (1 fake per century)

