

Virgo update

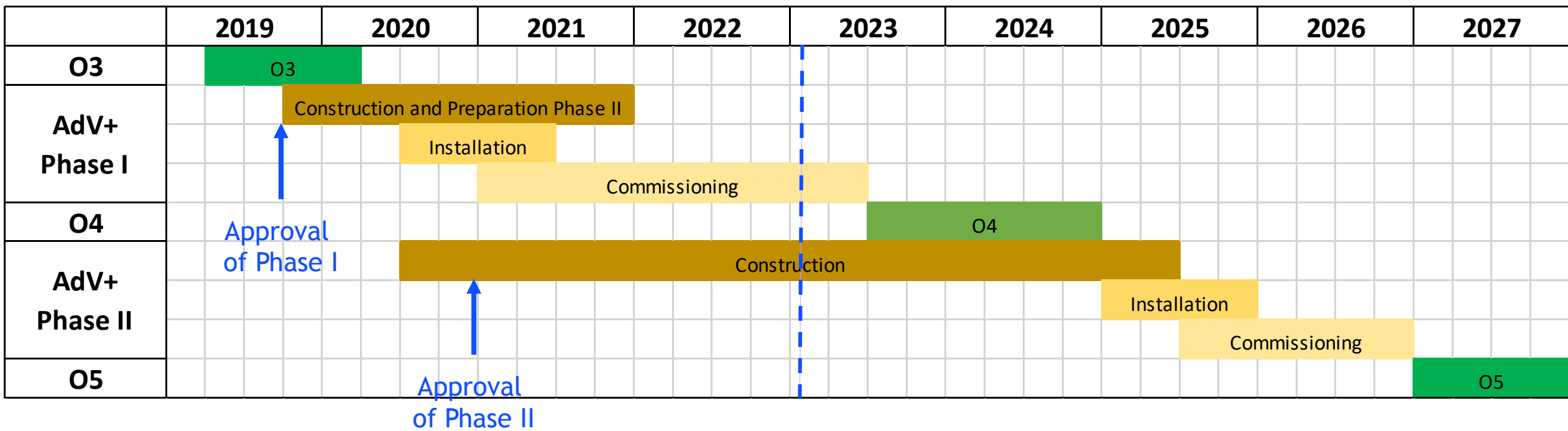
Raffaele Flaminio

CNRS/LAPP

for the Virgo Collaboration

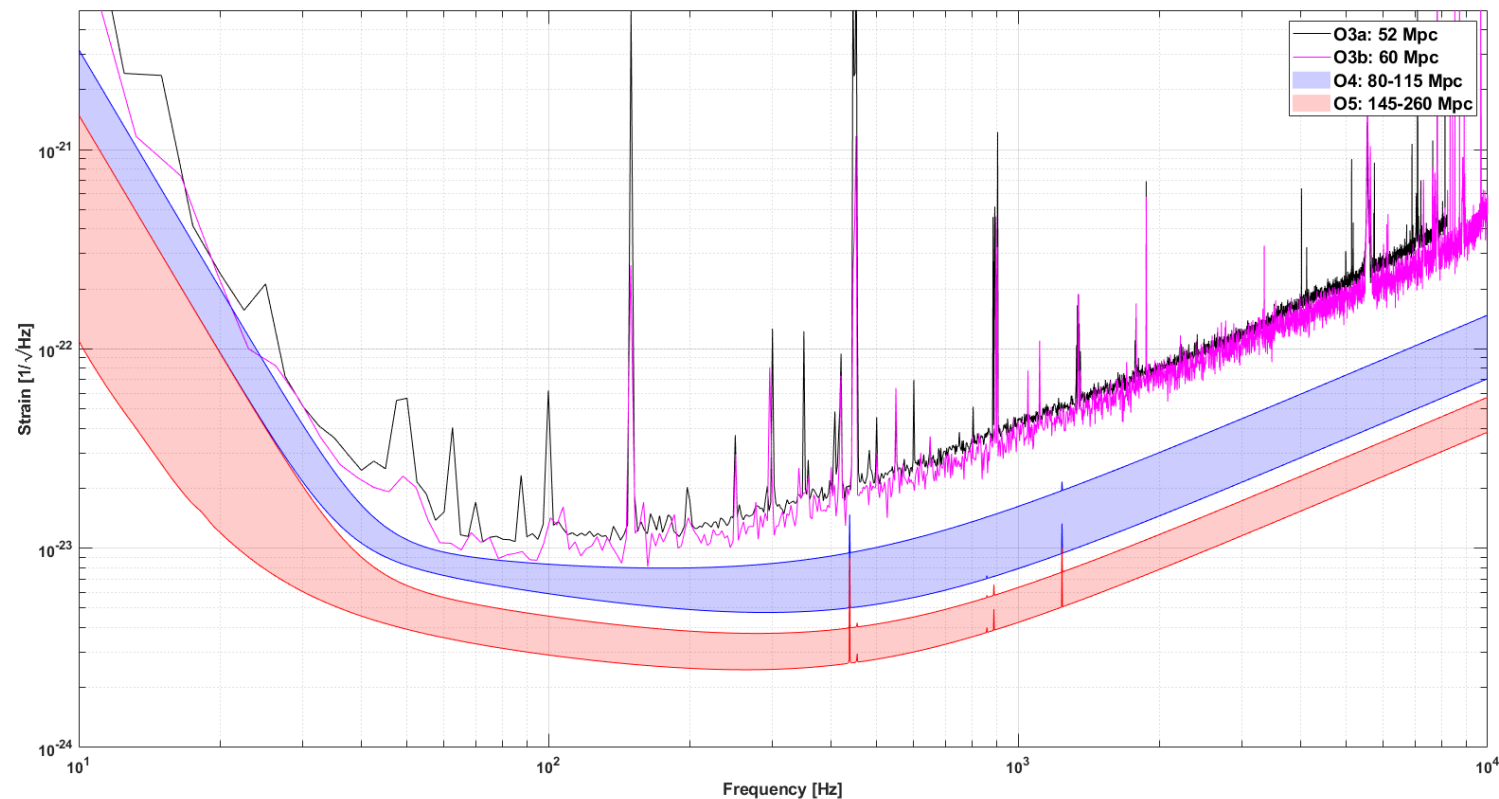
Advanced Virgo+ schedule

- New planning with O4 duration = 18 months and O4 start = May 24th



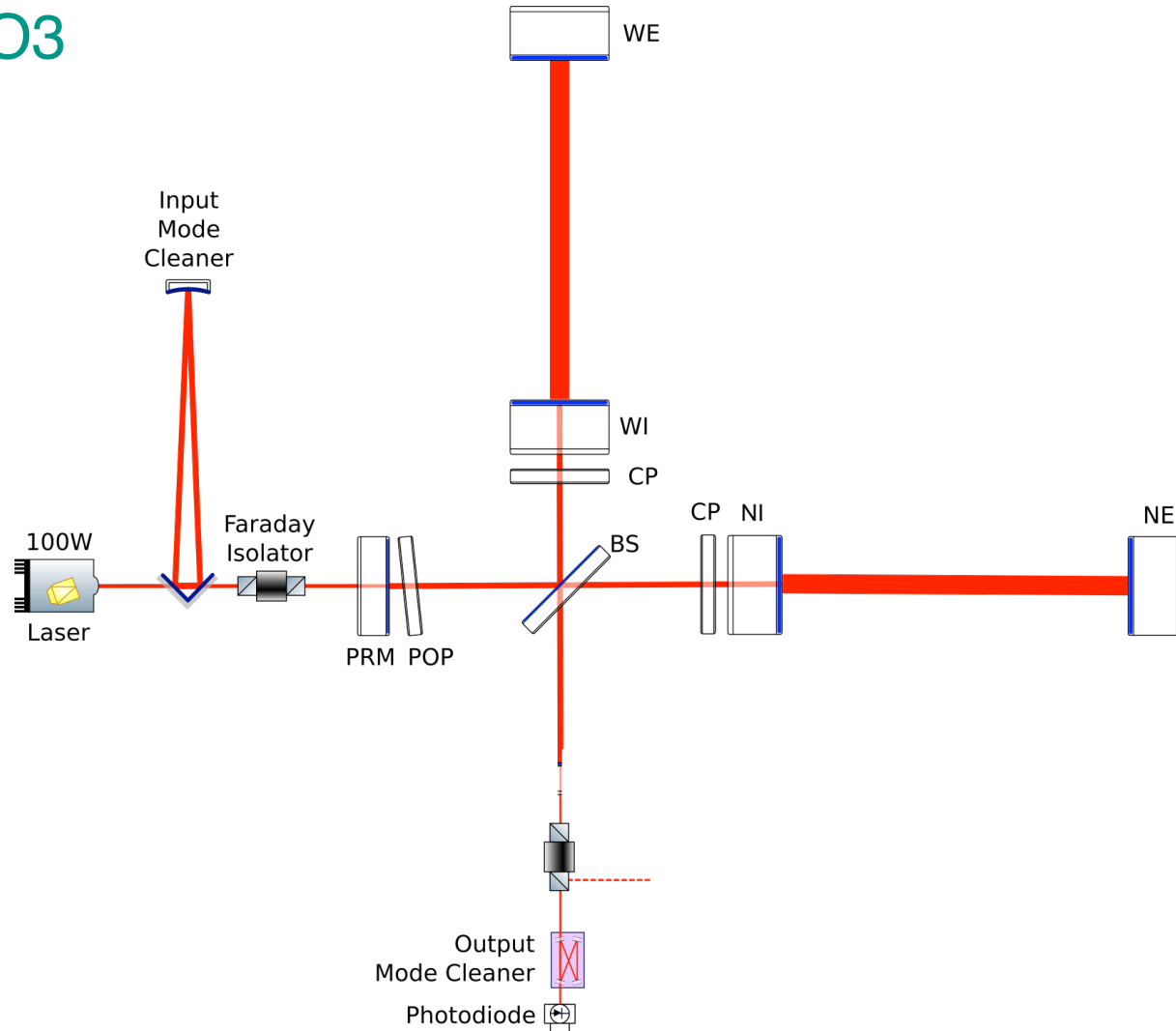
Advanced Virgo+ design sensitivity

- Phase I: reduce quantum noise, hit against thermal noise. BNS range: 100 Mpc's
- Phase II: lower the thermal noise wall. BNS range: 200 Mpc's or more

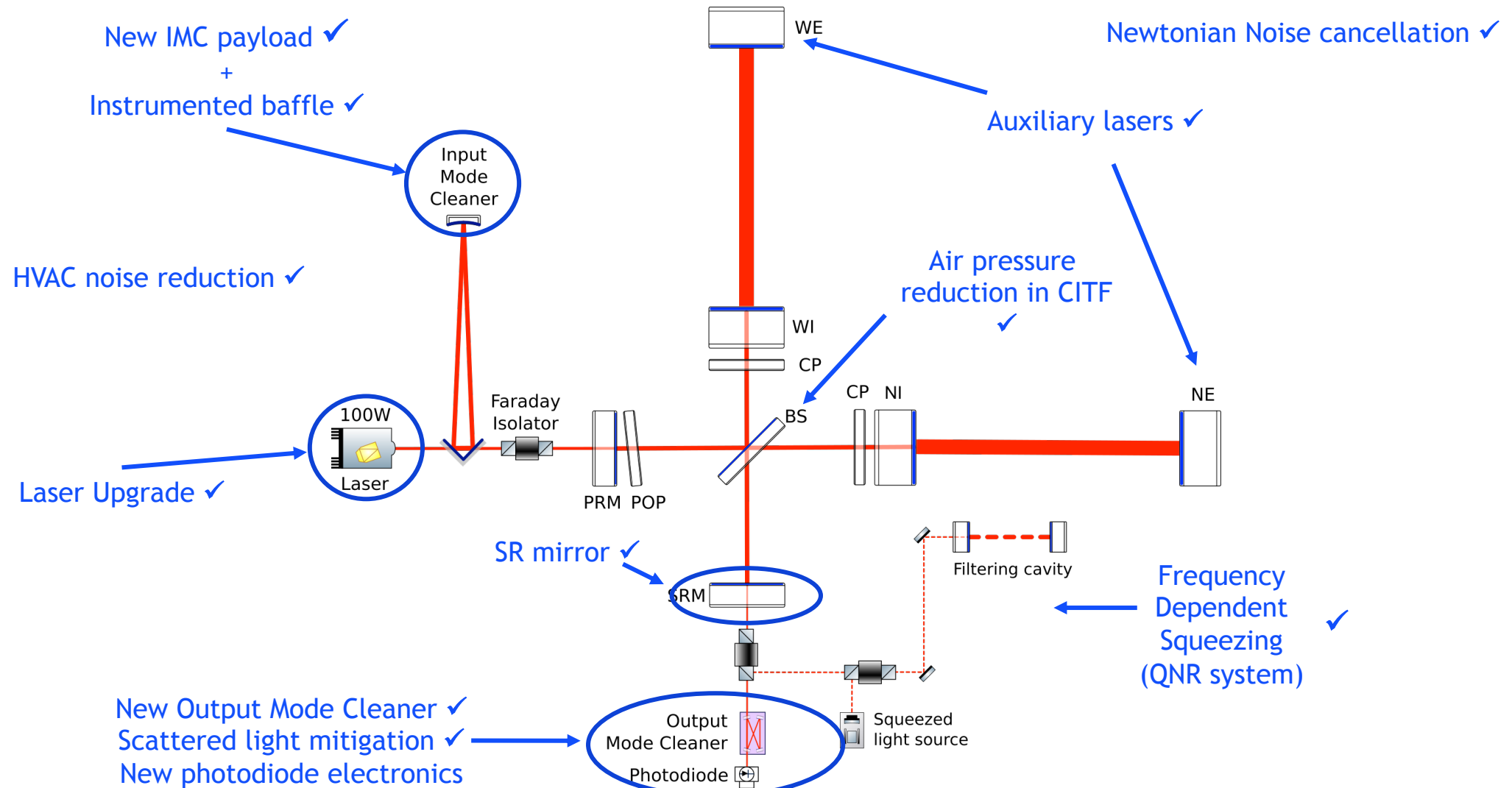


Advanced Virgo+ Phase I

- Configuration during O3



Advanced Virgo+ Phase I



Reminder

- Installation completed in the first semester of 2021
- First 2-hours operation of signal recycled interferometer in November 2021
 - ◆ 33W input power
- Frequency dependent squeezed vacuum source operated for long periods in the first semester of this year
 - ◆ Frequency dependent squeezing observed down to 25 Hz
- Main issues until this fall:
 - ◆ Reproducibility of interferometer operation
 - ◆ Interferometer frequency response

● The good news

- ◆ Reproducible operation with signal recycling cavity achieved
 - » Interferometer has the expected larger bandwidth provided by signal recycling
- ◆ Able to operate the interferometer over long periods
 - » Routinely run at night
 - » Two-days engineering run done early November
- ◆ First sensitivity curves measured
 - » Noise hunting started

● The less good news

- ◆ One suspension fiber break mid-November
 - » Happened during a venting (understood)
 - » Repair completed mid-December
 - » One month was needed
- ◆ Interferometer control recovered last week
 - » 5 weeks were needed

● Bottom line

- ◆ About 2 months of delay accumulated due to the fiber incident
- ◆ Now starting sensitivities measurement again

● Working to start O4 on May 24th

- ◆ Tight planning