Today's visit

Virgo/EGO visit, 2018

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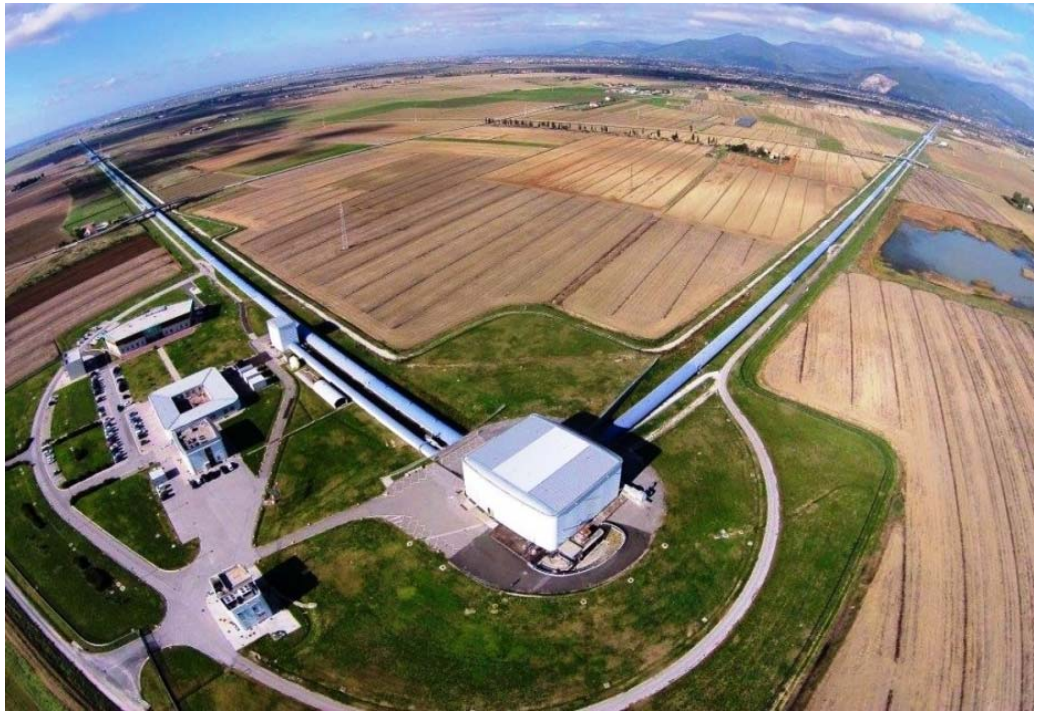

EGO EUROPEAN GRAVITATIONAL OBSERVATORY
cnrs dépasser les frontières
LAL LABORATOIRE DE L'ACCÉLÉRATEUR LINÉAIRE
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Welcome!

- Welcome to the European Gravitational Observatory (EGO)
  - Site of the Virgo experiment

- Virgo is a giant (3-km arms) suspended and recycled Michelson interferometer designed to make direct detections of gravitational wave (GW) signals

- Advanced Virgo (AdV) is the second generation Virgo detector
  - 5-year upgrade followed by a successful data taking period in August 2017 and a new upgrade period ongoing until the end of the year
  - Ultimate goal: improve the overall sensitivity by one order of magnitude

- Advanced Virgo joined the two Advanced LIGO (aLIGO) detectors on August 1, 2017 for a first common data taking period
  - Until August 25, 2017

  → Two major detections: GW170814 and GW170817

- Currently: commissioning period, following a major upgrade of the detector
  - Goal: improve the sensitivity by a factor ~2

  → Target: new joint LIGO-Virgo data taking period starting early 2019

A bit of history

- 1980's: Collaboration between Alain Brillet (CNRS, Orsay, lasers) and Adalberto Giazotto (INFN, Pisa, suspensions)
- 1989: Proposal
- June 27 1994: Project approved by CNRS and INFN
- May 1997: Final design report
- 2003: End of construction phase
- 2007-2010: Data taking periods
  - Virgo first, then Virgo+

- 2011-2016: Upgrade to Advanced Virgo
  - 2015: first direct detections of gravitational waves
    → Data recorded by Advanced LIGO, jointly analyzed by LIGO and Virgo
- 2016-2017: Advanced Virgo commissioning
- 2017: First joint Advanced LIGO – Advanced Virgo data taking period
  - August 2017: first detections by the LIGO-Virgo 3-detector network

Virgo from the sky