**Today's visit** 

#### Virgo/EGO visit, 2018

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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
  - Commissioning in progress after a 5-year upgrade
  - 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
  - $\rightarrow$  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

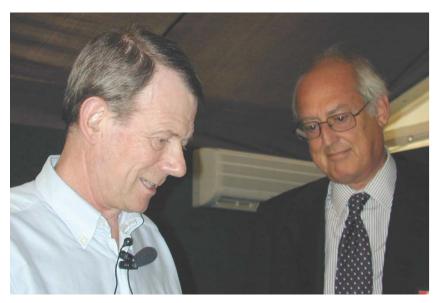
## Program of today's visit

• Indico page: <u>https://events.ego-gw.it/indico/conferenceDisplay.py?confId=70</u>

nemistry	and Biology
red by Nicolas Arr	aud (LAL (CNRS/IN2P3 & Université Paris-Sud)), Severine Perus
dnesday, 30 l EGO, Virgo s	May 2018 from <b>08:00</b> to <b>18:00</b> (Europe/Rome) ite
Description	About 40 people
Material	The details of the site visit will depend on the site activities scheduled for that day.
	A selection of educational resources in English 🧬 Virgo news 🖻 Virgo public website 🕑
	Virgo status 🕜 h The Gravitational Voice 🔄
Wednesday	, 30 May 2018
10:00 - 10:10	Welcome, presentation of the visit 10' Speaker: Dr. Nicolas Arnaud (LAL (CNRS/IN2P3 & Université Paris-Sud))
10:10 - 10:40	The Virgo detector 30'
	Speaker: Dr. Julia Casanueva (INFN Pisa)
10:40 - 10:50	Break
10:50 - 11:20	The detection of gravitational waves 30'
	Speaker: Dr. Nicolas Arnaud (LAL (CNRS/IN2P3 & Université Paris-Sud)) Material: Slides 📆
11:20 - 11:30	
11:30 - 12:00	Break
11.30 - 12.00	Multi-messenger astronomy 30' From remote.
	Speaker: Giuseppe Greco ((1) Università degli Studi di Urbino; (2) INFN-Firenze)
12:00 - 12:10	Break
12:10 - 13:00	Site visit 50'
	Speakers: Dr. Nicolas Arnaud (LAL (CNRS/IN2P3 & Université Paris-Sud)), Dr. Valerio Boschi
	Material: Animation: the Advanced Virgo detector

# 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

