

# Today's visit

## Virgo/EGO visit, 2018

**Nicolas Arnaud** ([narnaud@lal.in2p3.fr](mailto:narnaud@lal.in2p3.fr))

**Laboratoire de l'Accélérateur Linéaire (CNRS/IN2P3 & Université Paris-Sud)**  
**European Gravitational Observatory (Consortium, CNRS & INFN)**



# 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**
  - **Two major detections: GW170814 and GW170817**
- **Currently: commissioning period, following a major upgrade of the detector**
  - **Goal: improve the sensitivity by a factor  $\sim 2$**
  - **Target: new joint LIGO-Virgo data taking period starting early 2019**

# Program of today's visit

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

## Visit: group from the Linköping University Sweden, Dept. of Physics, Chemistry and Biology

chaired by Nicolas Arnaud (LAL (CNRS/IN2P3 & Université Paris-Sud)), Severine Perus

**Wednesday, 30 May 2018 from 08:00 to 18:00 (Europe/Rome)**  
at **EGO, Virgo site**

[Manage](#)

**Description** About 40 people

The details of the site visit will depend on the site activities scheduled for that day.

**Material**

[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: <a href="#">Slides</a>
11:20 - 11:30	Break
11:30 - 12:00	Multi-messenger astronomy 30' <i>From remote.</i> 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: <a href="#">Animation: the Advanced Virgo detector</a> <a href="#">Drone visit of Virgo</a>

# 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

