Thomas VUILLAUME

Activités et vision pour le domaine HTC / HPC

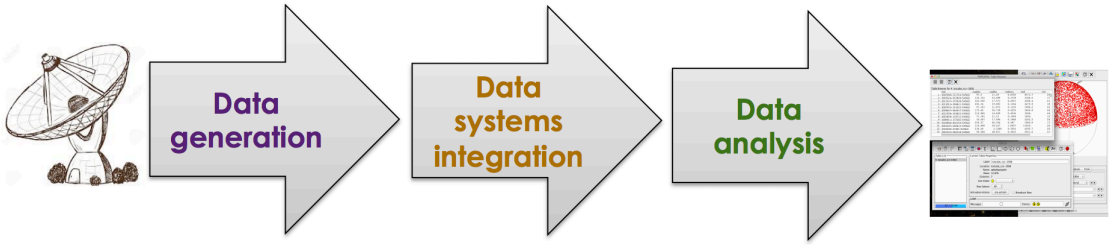
Feb. 22, 2017

ASTERICS

- **ASTERICS** is a research infrastructure funded by the European commission's Horizon 2020 framework
- Bringing together the **astronomy**, **astrophysics**, **and particle astrophysics** communities
- The major **objectives** of ASTERICS
  - Find common solutions between the experiments
  - Support and accelerate the implementation of the ESFRI telescopes
  - Enhance their performance beyond the current state-of-the-art
  - To see them interoperate as an integrated, multi-wavelength and multi-messenger facility
- **ESFRI**: European Strategy Forum on Research Infrastructure
- Experiments:
  - SKA, CTA, KM3NET, E-ELT
  - EUCLID, LSST, Virgo/EGO, LOFAR, e-VLBI, H.E.S.S., MAGIC, ANTARES

OBELICS

- One of the five ASTERICS **work packages**
- **OBELICS**: Observatory E-environments Linked by common ChallengeS



- **Objectives**
  - Enabling interoperability and software re-use for the data generation, integration and analysis
  - Creating an open innovation environment for establishing open standards and software libraries for multi-wavelength/multi-messenger data
  - Finding common solutions for: streaming data processing, extremely large databases, advanced analysis algorithms, software framework

OBELICS school

- One of the specific **objectives** of OBELICS is
  - Train researchers and data scientists to apply state-of-the-art parallel software programming techniques, to adopt big-data software frameworks, to benefit from new processor architectures and e-science infrastructures

    → 3 schools planned

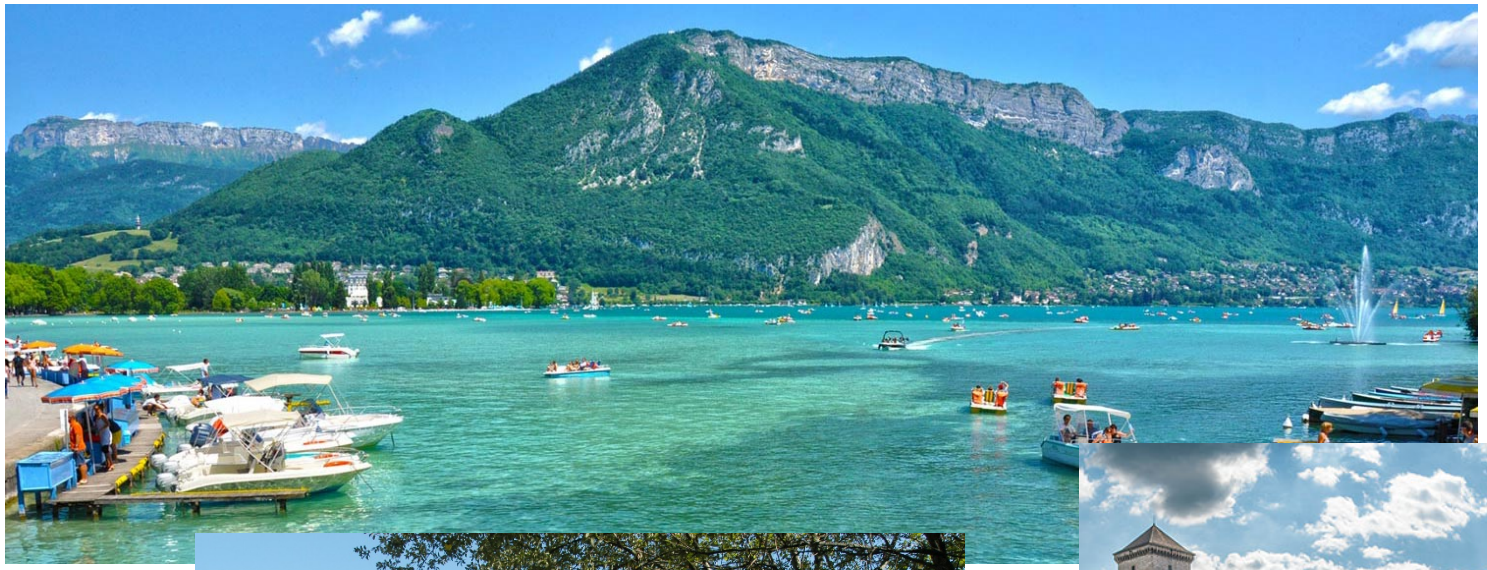
- The **purpose of the school** is to support researchers to best practice programming to be able to exploit the computing architectures with the highest potential performance for their specific purpose

- This training event is a **deliverable** of the OBELICS package

General facts

- **Venue:** LAPP-Annecy, 6-9 June 2017 (4 days)
- **Subtitle of the school**
  - Advanced software programming for astrophysics and astroparticle physics
- **Topics**
  - Efficient code design
  - Parallel programming
  - GPU programming
  - Python libraries for astronomy and astroparticle physics
- **Programming language:** Python
- **Target audience:** PhD students, postdocs, senior researchers, intermediate level
- **Number of participants:** maximum 60

Annecy in June



International program committee

- Dominique Boutigny, LAPP, LSST
- Eric Chassande-Mottin, APC, Virgo
- Nicolas Chotard, LAPP, LSST, OBELICS
- Yannick Copin, IPNL, EUCLID
- Kay Graf, ECAP-FAU, KM3NeT
- Tammo Jan Dijkema, Astron, LOFAR
- Gianluca Lamanna, INFN
- Giovanni Lamanna, LAPP, H.E.S.S./CTA
- Xavier Martorell, BSC, PRACE representative
- Zheng Meyer-Zhao, SURFsara, PRACE representative
- Bojan Nikolic, Cambridge, SKA
- Vincent Poireau, LAPP, H.E.S.S./CTA, chair
- Thomas Vuillaume, LAPP, H.E.S.S./CTA

+ Jayesh Wagh, LAPP, OBELICS, as executive manager

Program of the school

- **Lectures** in the morning, **hand-on** sessions in the afternoon

- Block 1 => **Efficient code design**
  - Good code practice & traps to avoid
  - Project management/organisation + continuous integration
  - Profiling and debugging

- Block 2 => **Parallel & GPU programming**

- Block 3 => **Libraries for astronomy & astrophysics**
  - Generic libraries: numpy, scipy, pandas, matplotlib, numba
  - Specific libraries: astropy, gammapy, casacore
  - Python/C++ wrappers

- **Lecturers** being finalized

To be finalized

Morning program

Time	Mon	Tues	Wed	Thur	Fri	Sat	Time
8:00		Registration					8:00
8:15							8:15
8:30							8:30
8:45							8:45
9:00		Welcome	GPU programming in Python	GPU & parallel programming in Python	Project management	Departure	9:00
9:15		Laptop preparation					9:15
9:30							9:30
9:45		Good code practice					9:45
10:00					Continuous integration		10:00
10:15							10:15
10:30		Coffee break	Coffee break	Coffee break			10:30
10:45							10:45
11:00		Overview of Python libraries	Profiling & debugging	Hands-on: Python libraries	Coffee break		11:00
11:15				Hands-on: Python libraries			11:15
11:30					Python/C++ wrappers		11:30
11:45							11:45
12:00							12:00
12:15							12:15

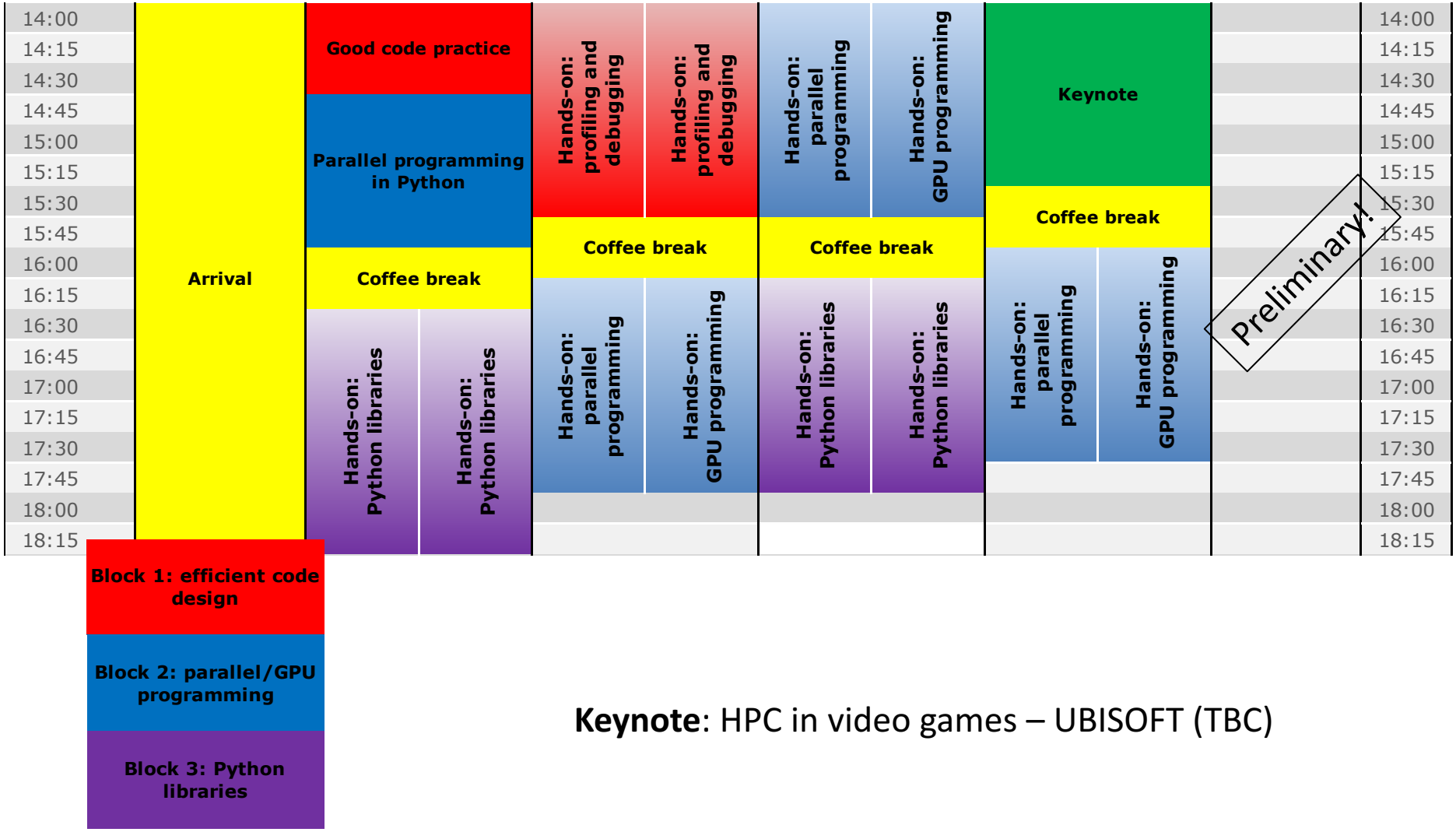
Preliminary!

Block 1: efficient code design

Block 2: parallel/GPU programming

Block 3: Python libraries

Afternoon program



Block 1: efficient code design

Block 2: parallel/GPU programming

Block 3: Python libraries

Keynote: HPC in video games – UBISOFT (TBC)

Social program

- **Welcome reception** on Monday evening

- **Buffet Haut-Savoyard** on Tuesday evening

- **Dinner cruise** on the Annecy lake on Wednesday night

Registration

- Registration **about to be opened**!
  - Deadline : 31st of March
- Web site
  - https://indico.in2p3.fr/event/14227/
- **Fees**: 150 € - few student scholarships
- **Includes**
  - 4 lunches, coffee breaks
  - 5 nights at centre Jean XXIII
  - All social events