BigDAPHNE: BIG DAta in PHysics NEtwork

Network for an Innovative Doctorate Training in Fundamental Physics Research and Big Data

a proposal for an Innovative Training Network (ITN) for a European Joint Degree (EJD)

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PhD Training in Physics with additional training in BigData Handling and analysis

BigDAPHNE

Research focus

- PhD in Physics
  - Particle Physics - ATLAS-LHC
  - Cosmology - VIRGO, EUCLID, SKA (tbd)
- Double PhD obtained in 2 institutions of the network

Training focus

- BigData technology and tools
- Internships in companies
- Good SW practices and experience in communicating SW

ITN/ European Joint Degree

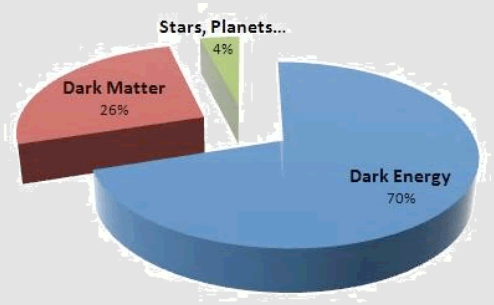
The project in a nutshell

- 15 PhD students
- PhD thesis on Particle Physics or Cosmology experiments related to use of BigData
  - Particle Physics: ATLAS
  - Cosmology: EUCLID, Virgo, SKA (?)
- Each student will:
  - obtain a double deegre from two universities in the network
  - Follow training on BigData retrival/handling/analytics
  - Follow training on good Software practice
  - do an 3-4 month internship in a company/institute on a BigData project

BIG DATA CHALLENGES AND FUNDAMENTAL RESEARCH

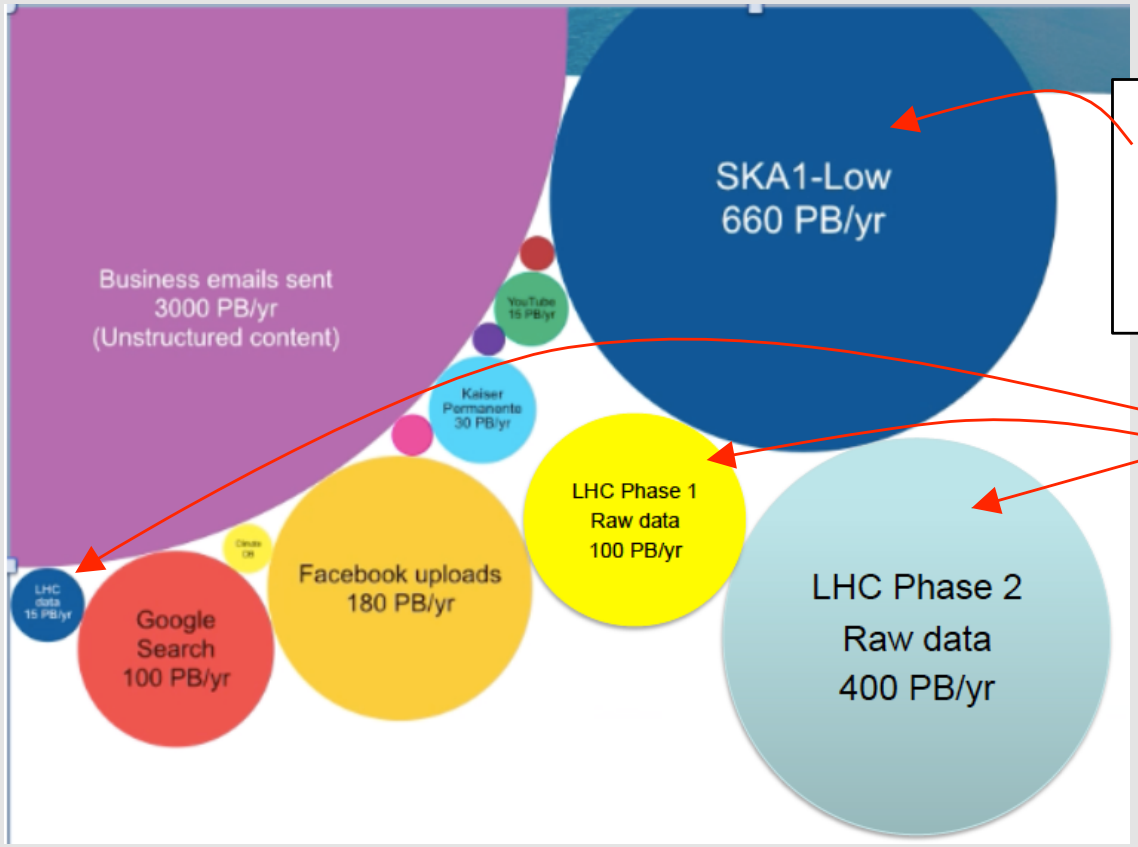
(Particle Physics and Cosmology)

→ The experiments that we have in the network are:
- → ATLAS/LHC – High Energy Physics
- → Virgo – Gravitational wave
- → EUCLID/SKA – Dark Energy exploration



→ Experiments have been selected to cover a wide range of frontier research in fundamental physics the idea is to present them as able to explore the still un-seen in fundamental physics:
- → dark-matter (ATLAS, EUCLID/SKA)
- → dark-energy (EUCLID/SKA)
- → gravity (Virgo, EUCLID/SKA)
- → precision measurements sensitive to new physics (Higgs couplings, vector-boson couplings… ATLAS)

→ All experiments have challenges related to BigData (Handling and Analysis)



→Need to propose research subjects that are:

- → reasonable for a thesis to be done between 2017-2020
- → fundamental subjects for each experiment
- → thesis must be shared across two universities

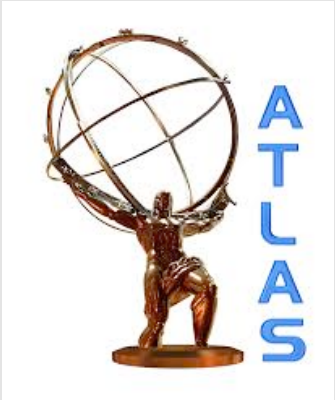
Academic Composition

Academic for Double Degree

Thessaloniki University – C. Petridou - Greece – ATLAS, Virgo
University College London – N. Konstantinidis – UK – ATLAS, EUCLID
Universita` di Lecce – S. Spagnolo - Italy – ATLAS, EUCLID
Comm. a l'energie atomique - R. Nikoloaidou – Saclay, France – ATLAS, EUCLID
Universita` di Pisa – C. Roda – Italy – ATLAS, Virgo

Draft Thesis sharing

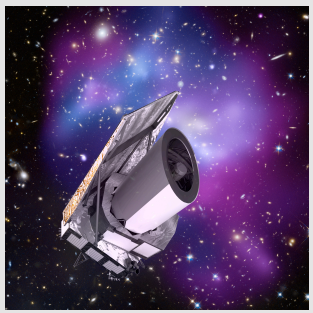
1. UNIPI-UCL - H→2b2tau
2. UNIPI-CEA – MET+bb
3. UCL-UNIPI – H→4b
4. UCL-UNISA – ZH(bb) and V+bjets
5. UNISA-AUTH – Diboson
6. AUTH-CEA – Invisible H
7. AUTH-UNISA – qTGC
8. CEA-AUTH – H→4l
9. CEA-UCL – Boosted H(bb)



Cover in a wide range of signatures Dark Matter searches, Higgs properties, exotic searches (anomalous boson couplings…)

10. UNIPI-AUTH Virgo
11. AUTH-UNIPI Virgo

12. UCL-UNISA Euclid
13. CEA-UCL EUCLID/SKA
14. UCL-CEA EUCLID/SKA
15. UNISA-UCL EUCLID



Structure of the proposal

The proposal is structured in Work Packages. For each work package we need to have: leading beneficiary, objectives, Description of work and role of each beneficiary and partner, deliverables.

WP Number		**Start Month – End Month**
WP Title	*(e.g. including Research, Training, Management, Communication and Dissemination…)*	
Lead Beneficiary		
Objectives		
Description of Work and Role of Specific Beneficiaries / Partner Organisations *(possibly broken down into tasks), indicating lead participant and role of other participants*		
Description of Deliverables *(brief description and month of delivery)*		

Work Packages – draft1

WP1 Frontier in HEP – R
WP2 Frontier in cosmology – R

WP3 BigData Analysis – R&T
WP4 BigData Handling – R&T

WP5 Training -
WP6 Management and coordination - UNIPI
WP7 Dissemination and outreach -

Research

Research and training

Coordination

Work Packages – draft1

WP1 Frontier in HEP – R

WP2 Frontier in cosmology – R

WP3 BigData A

WP4 BigData I

We need help to write this part. We would like to have one person for euclid and one for virgo for reference to help implementing this part

Research

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nd
ning

WP5 Training -

WP6 Management and coordination - UNIPI

WP7 Dissemination and outreach -

Coordinati
on

Approximate Timing

Indicative timetable for this call

Publication of call	*15 October 2015*
Deadline for submission of proposals	*12 January 2016 at 17:00:00, Brussels local time*
Evaluation of proposals	*March 2016*
Information on the outcome of the evaluation	*June 2016*
Indicative date for the signing of grant agreements	*September 2016*

- The project – if approved – last from June 2016 → June 2020
- June 2016 – June 2017
  - Organization of the network, Recruitments of students
- June 2017 – June 2020
  - Schools, thesis, internships…

Funding and burocratic roles

Funding is based on the number person-month of the project. We will require 540 person-months (15 PhD students)
For each month:

- PhD student salary: 3110 euro / person-month
- research, training and network fund: 1800 euro/ person-month
- management and overheads: 1200 euro/person-month

Beneficiaries are organisations that are full partners of a network and are signatories to the Grant Agreement. They contribute directly to the implementation of the research training programme by appointing, supervising, hosting and training researchers. They may also provide secondment opportunities. Beneficiaries take complete responsibility for executing the proposed programme and other requirements of the project.

Partner Organisations are not signatories to the Grant Agreement and do not employ the researchers within the project. Partner organisations provide additional training and/or host researchers during secondments.

Let’s go to your slides ☺