

# Cherenkov Telescope Array



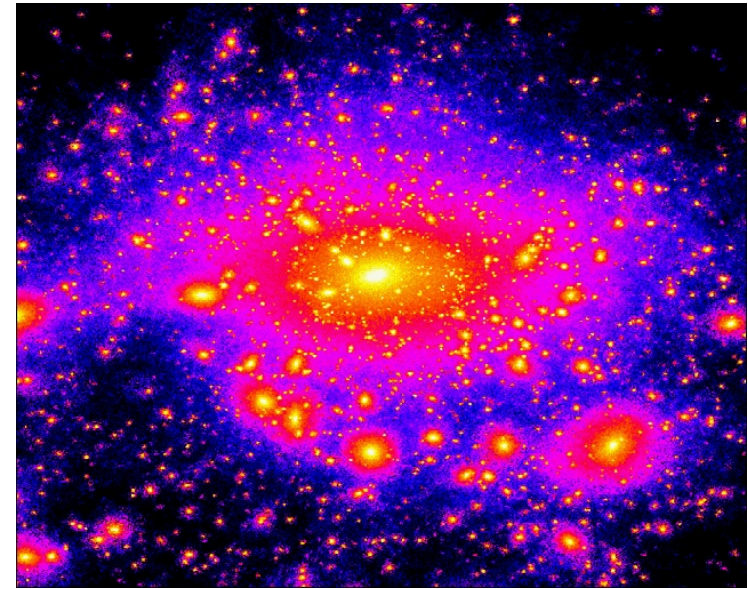
**Jürgen Knödlseher**  
**Coordinateur CTA CNRS**

# A unique window to the Universe

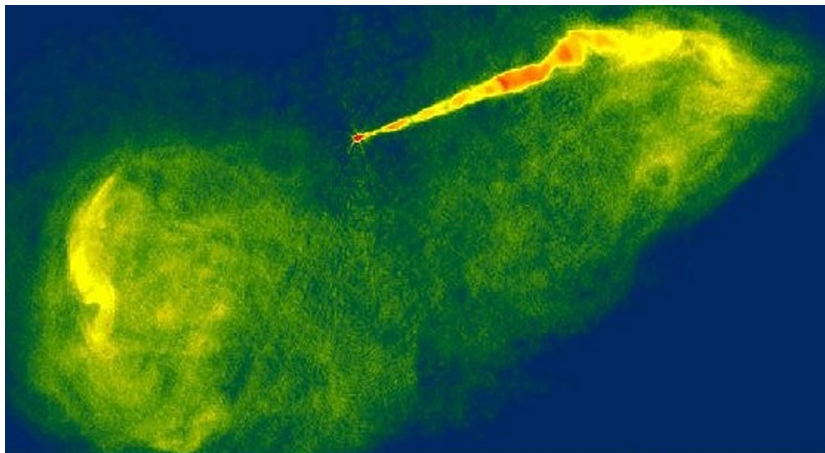
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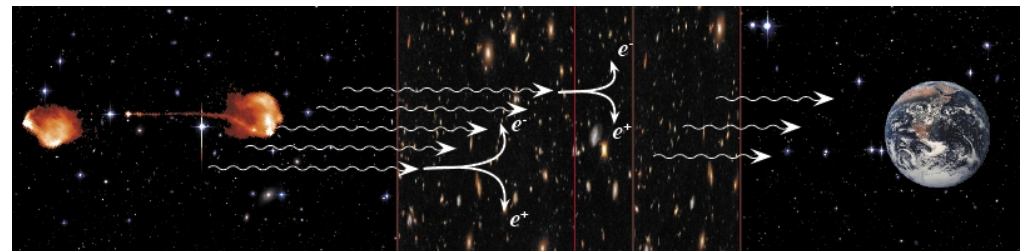
Cosmic ray accelerators



New physics



Black hole particle accelerators

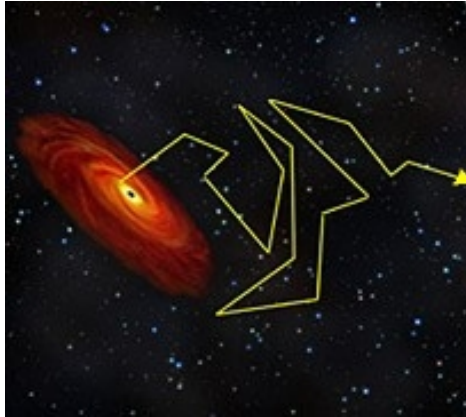


Probing the Universe

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# The fate of a particle

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Cosmic engine accelerates  
particle to TeV energies and  
beyond

# The fate of a particle

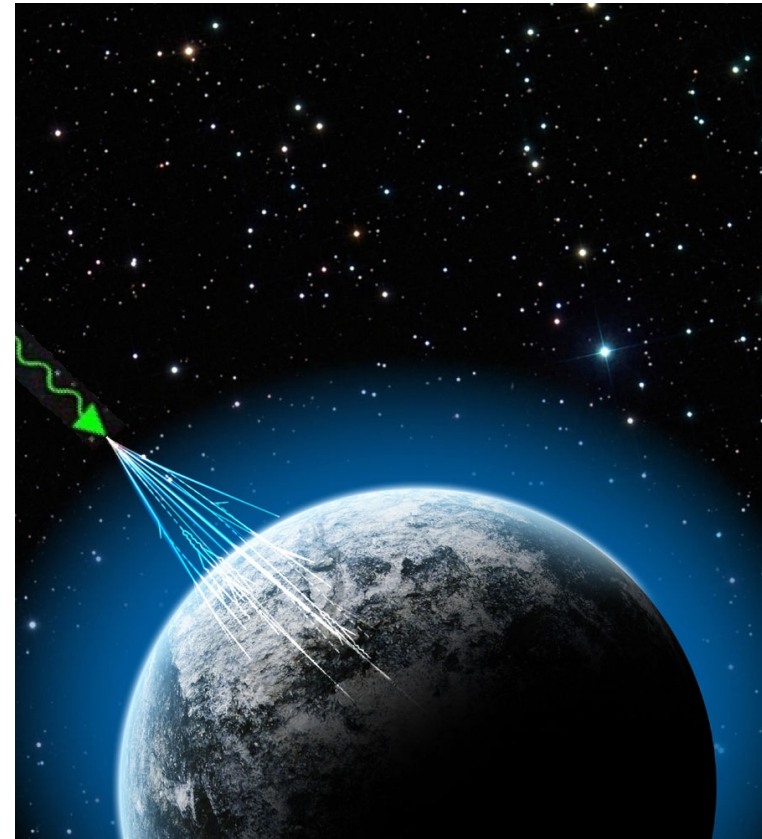
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Particle interacts with medium  
and converts into gamma ray

# The fate of a particle

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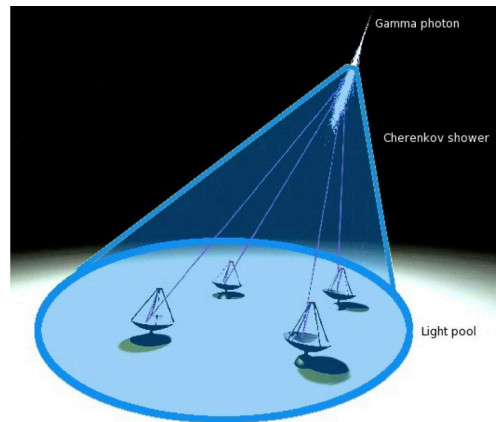
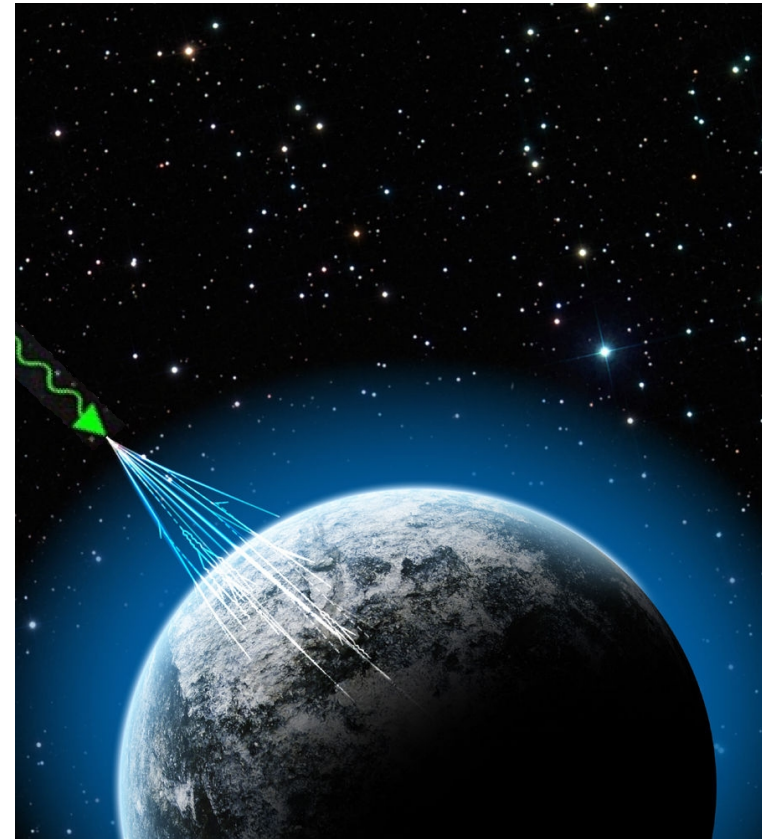


Few billion years later ...  
Gamma ray interacts with Earth  
atmosphere and converts into  
particles

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# The fate of a particle

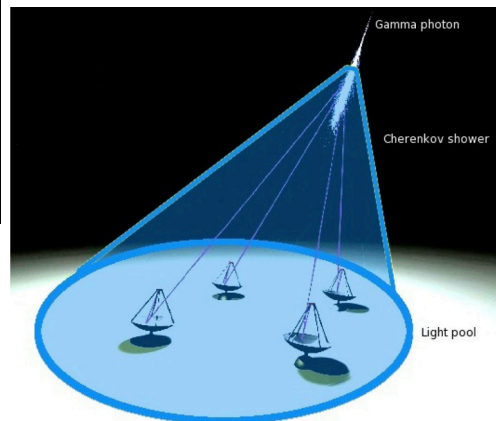
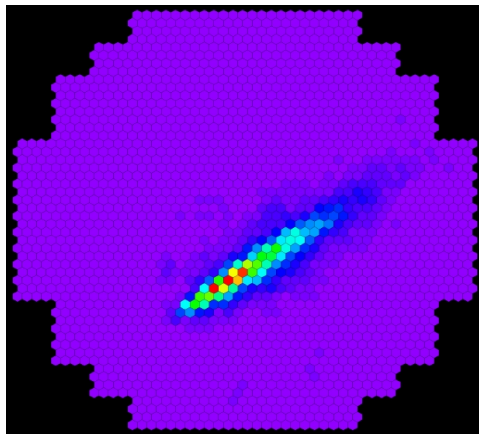
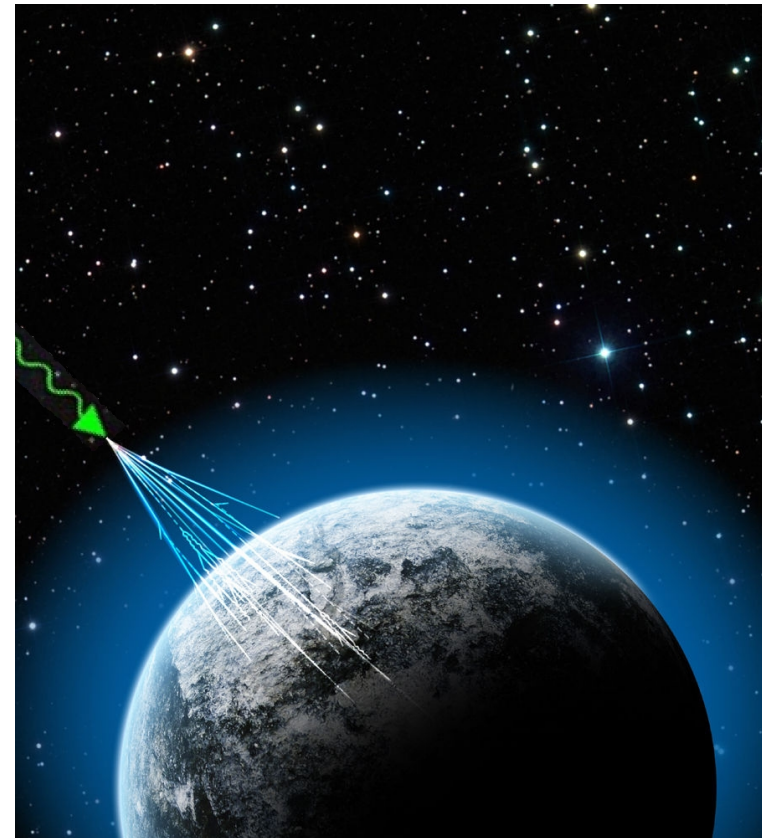
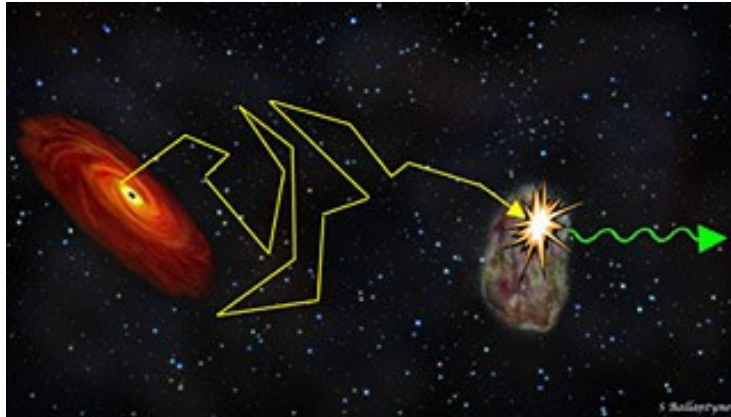
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Particles generate Cherenkov photons that hit a few milliseconds later the telescope mirrors

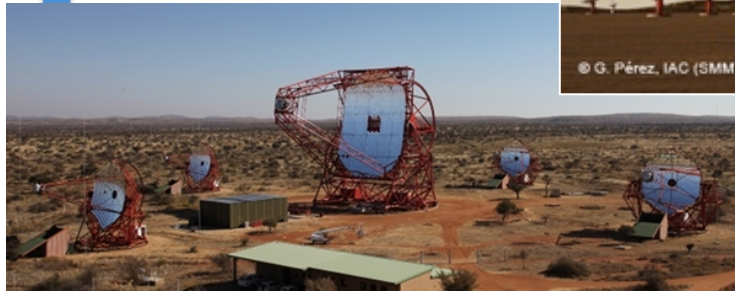
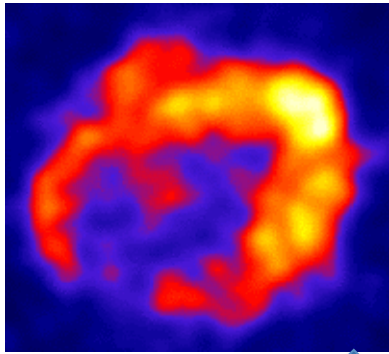
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# The fate of a particle

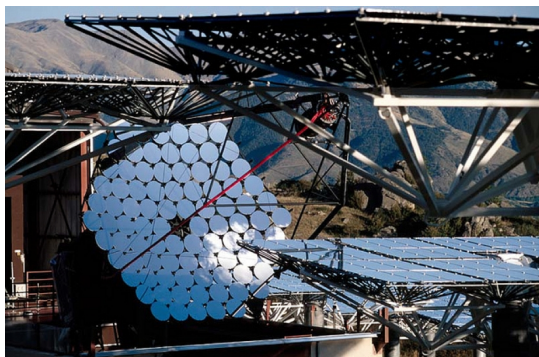


Photons hit camera  
PMTs and convert into  
electrons that are  
accelerated ...

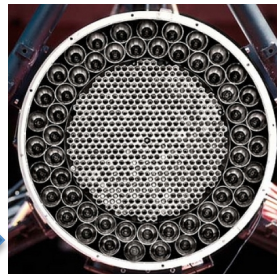
# The evolution of the field in France



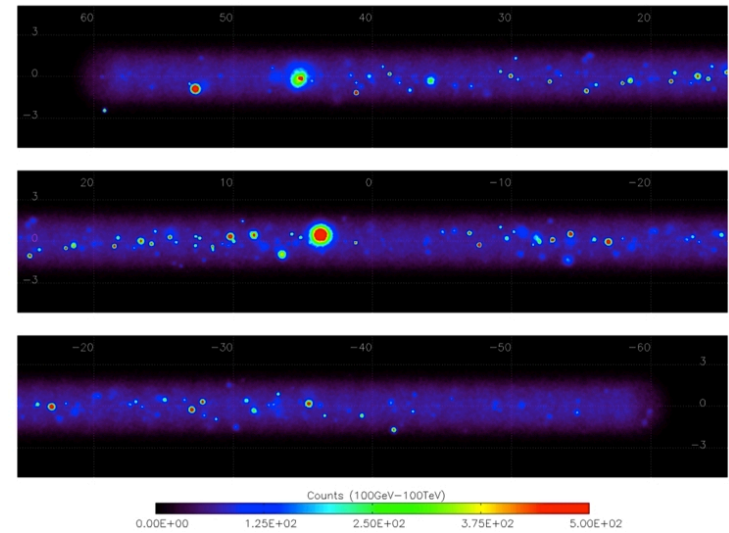
2003 – now: H.E.S.S.



1989 – 2002: Thémis site



The Future (2008 –)



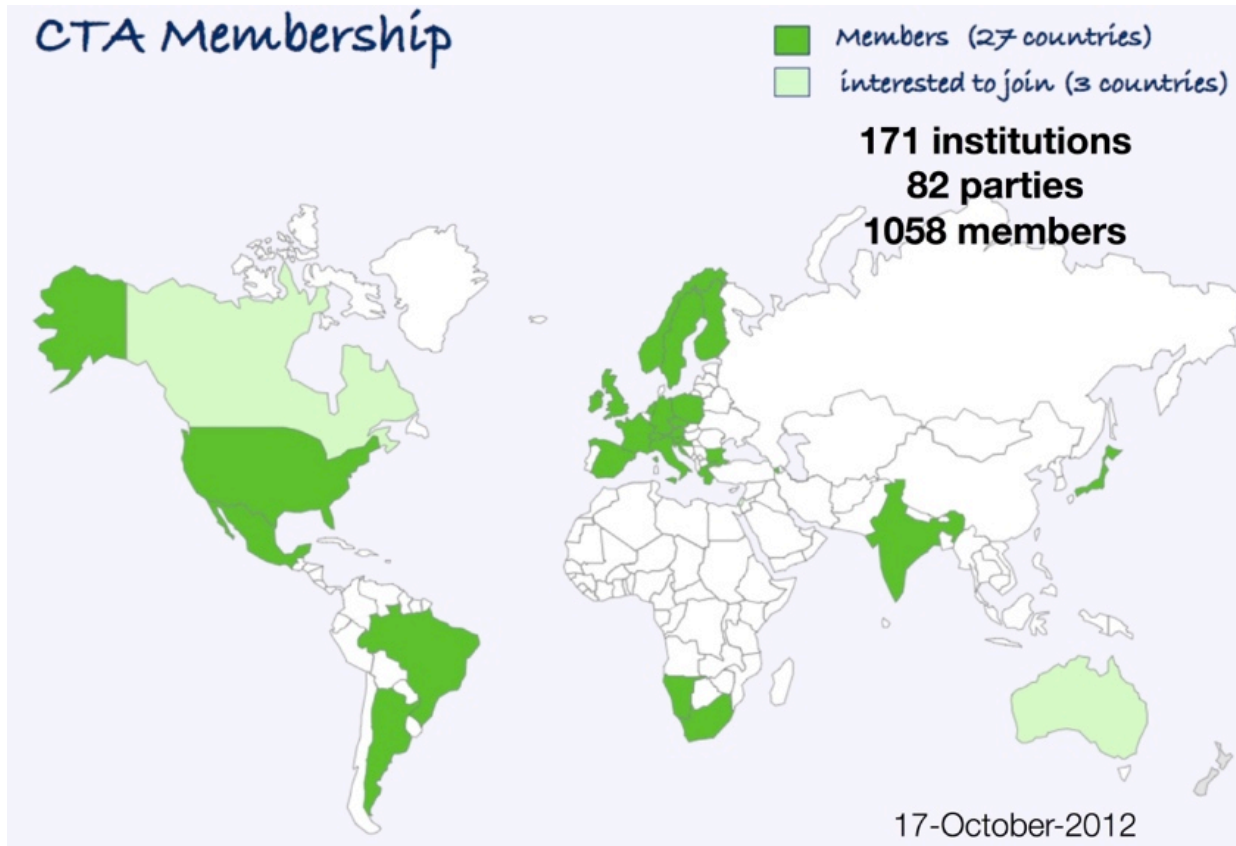




... recommended by relevant roadmaps



# ... developed by a world-wide collaboration



Country/Party	FTEs	FTEs %	Persons
x Germany	57.70	17.92	156
x France	54.66	16.98	161
x Italy	45.90	14.26	144
x Spain	33.15	10.30	80
USA	29.75	9.24	102
x Poland	27.63	8.58	66
x Japan	16.63	5.17	84
x United Kingdom	12.50	3.88	58
x Argentina	10.33	3.21	34
x Switzerland	9.30	2.89	33
Czech Republic	3.10	0.96	13
India	2.70	0.84	13
x Brazil	2.65	0.82	11
Sweden	2.65	0.82	12
Greece	2.48	0.77	25
Mexico	1.45	0.45	10
Finland	1.40	0.43	9
Norway	1.40	0.43	4
x Austria	1.30	0.40	8
Croatia	1.10	0.34	7
Bulgaria	1.05	0.33	7
x South Africa	1.04	0.32	6
Armenia	1.00	0.31	4
Netherlands	0.55	0.17	5
x Namibia	0.30	0.09	2
Ireland	0.20	0.06	3
Slovenia	0.05	0.02	1

x DoI signed

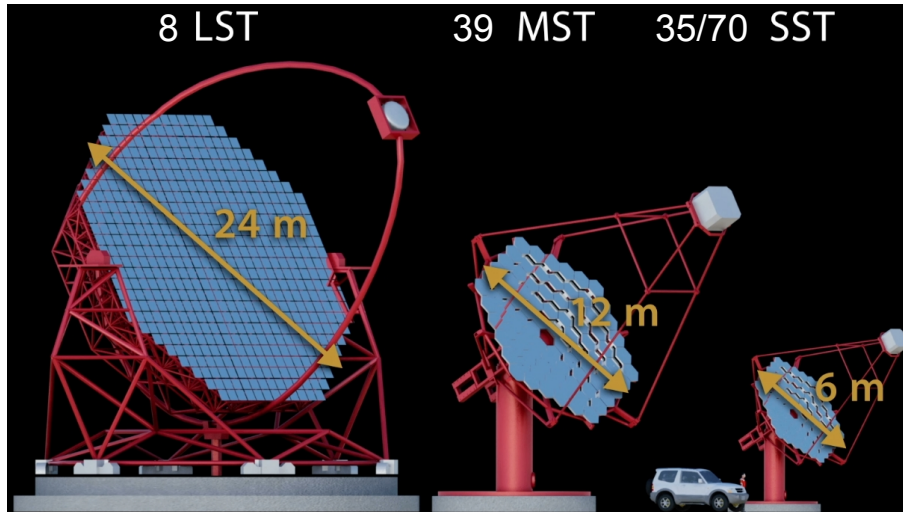


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Movie to be inserted later (big file)

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# The Cherenkov Telescope Array

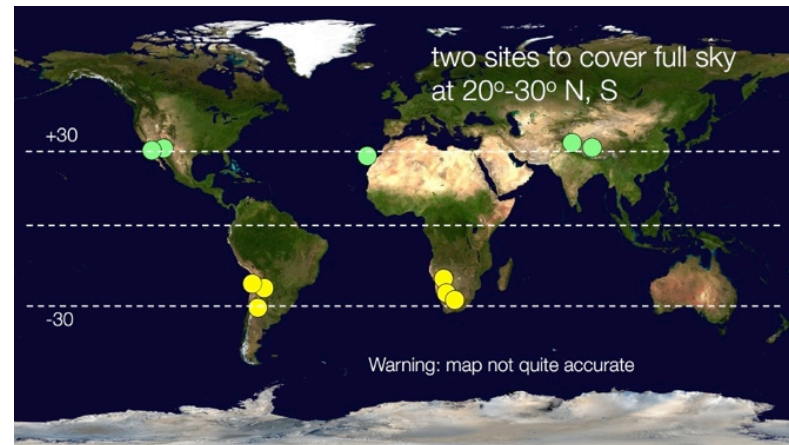
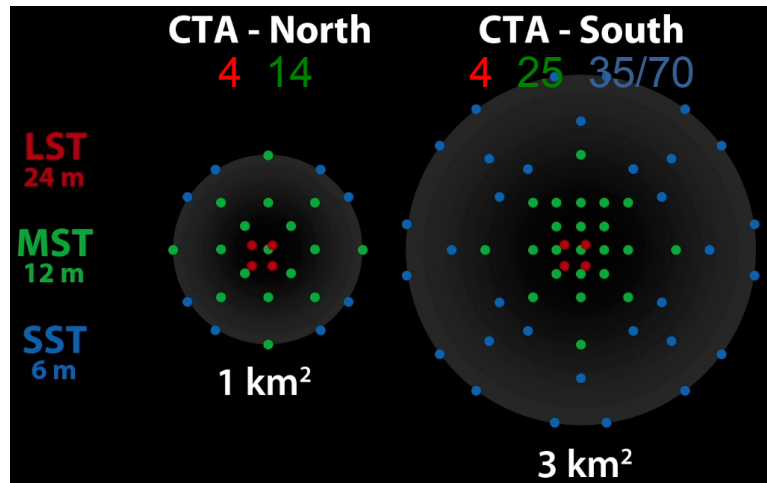


## Characteristics

- 3 telescope types
- 2 sites (north and south)
- Several tens of telescopes
- ~200 M€ investment cost (~20% French contribution)

## CTA vs H.E.S.S.

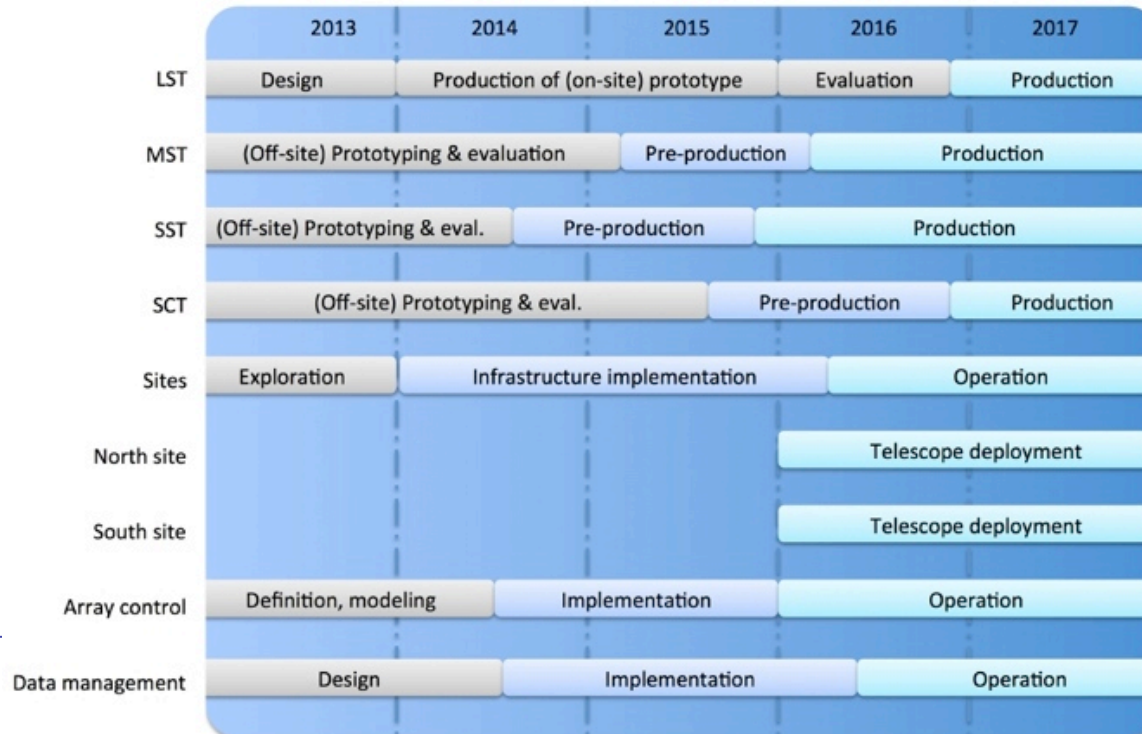
- x 10 better sensitivity (mCrab @ 1 TeV)
- Broader energy range (30 GeV – 100 TeV)
- Better angular resolution (5' @ 1 TeV)



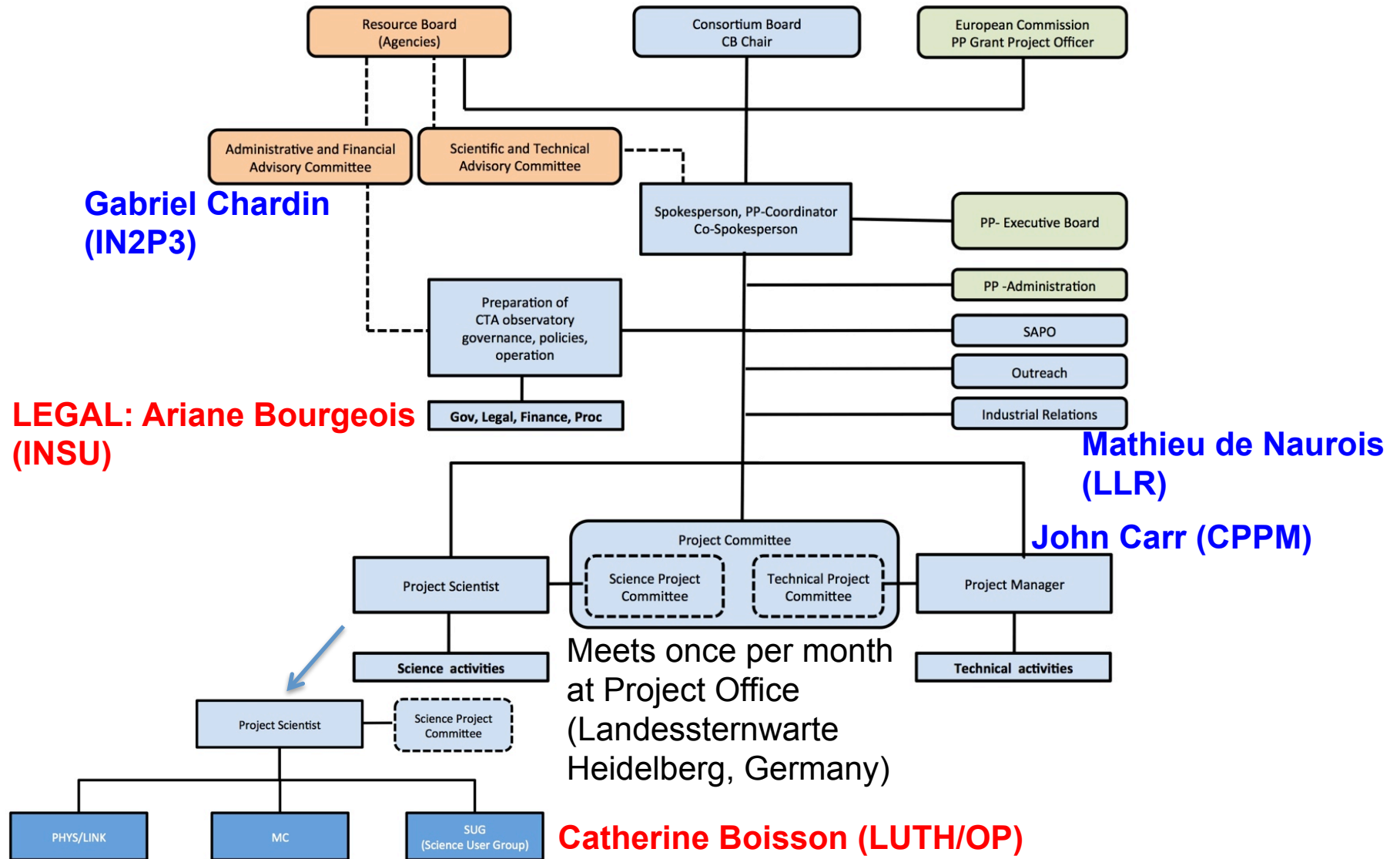


# The CTA project - timeline

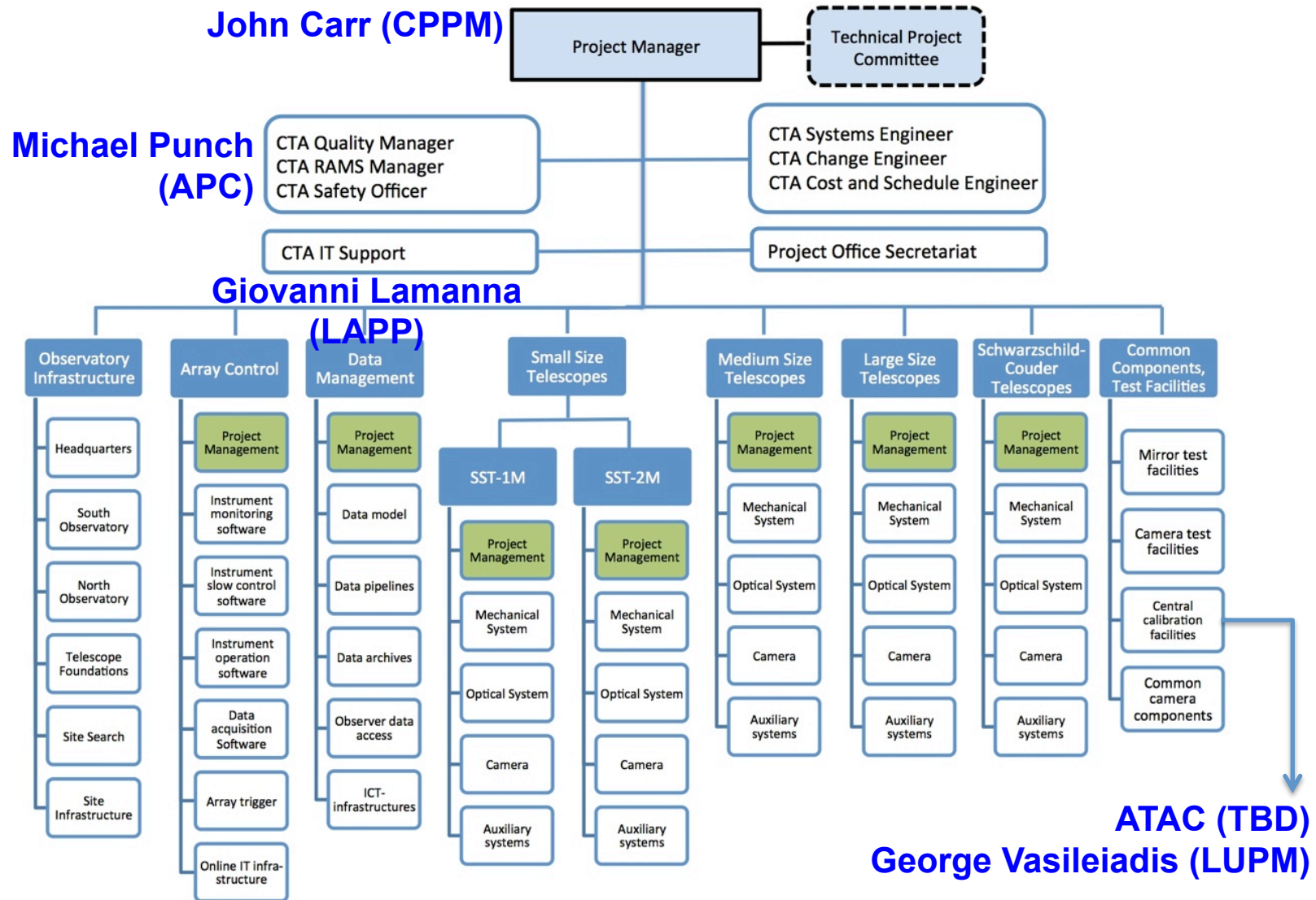
- 2008 Start of Design Study
- 2011 Start of FP7 Preparatory Phase (3 years, 5.2 M€, end 6/2014)
- 7/2012 Signature of Declaration of Intent (DoI) between funding Agencies
- 2/2013 First **Expression of Interest (EoI)**
- 2/2013 Science Performance and Preliminary Requirements Review
- 7/2013 Preliminary Design Review
- 12/2013 Site decision
- 3/2014 Critical Design Review
- 2017 First Science



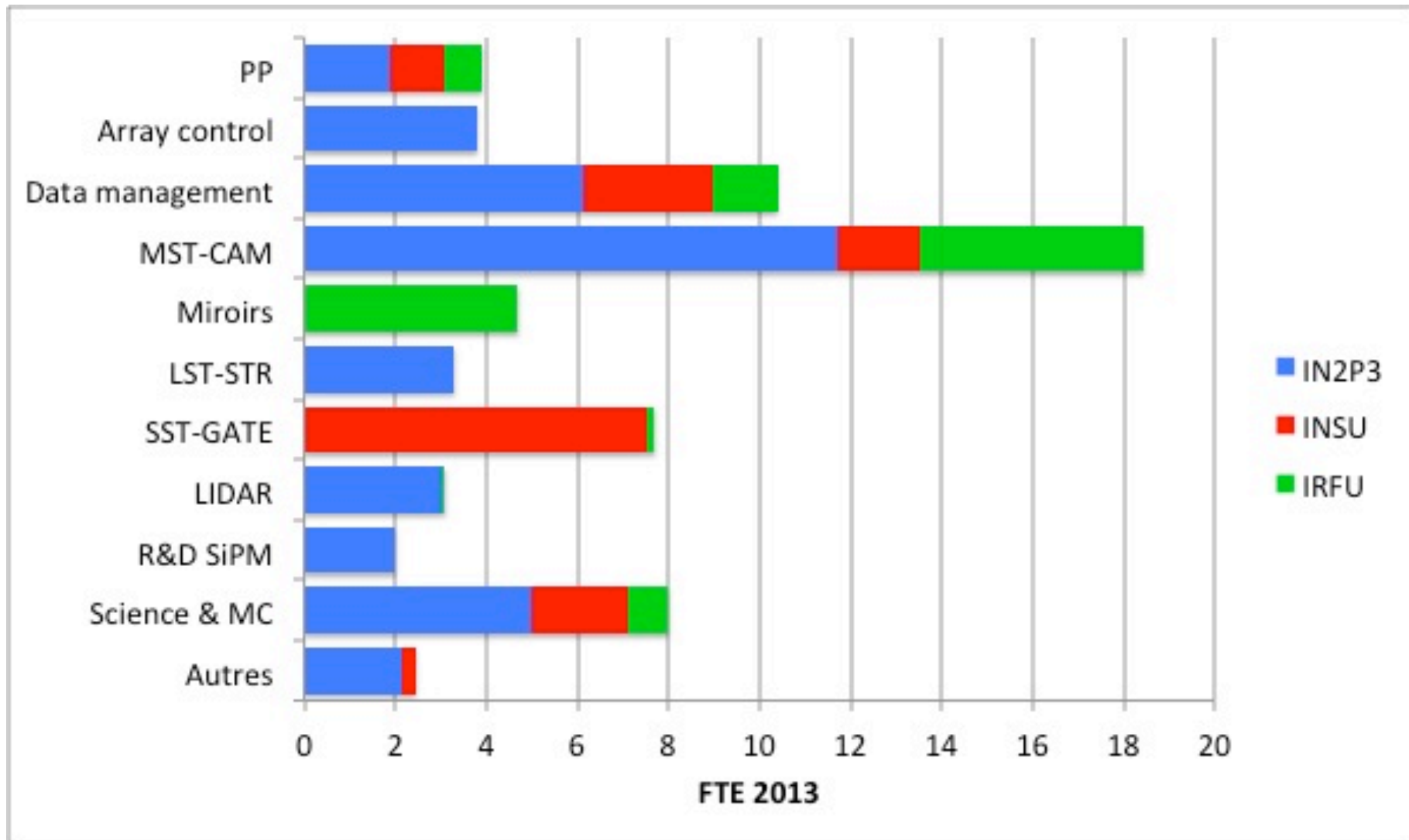
# International Project Organization (1/2)



# International Project Organization (2/2)



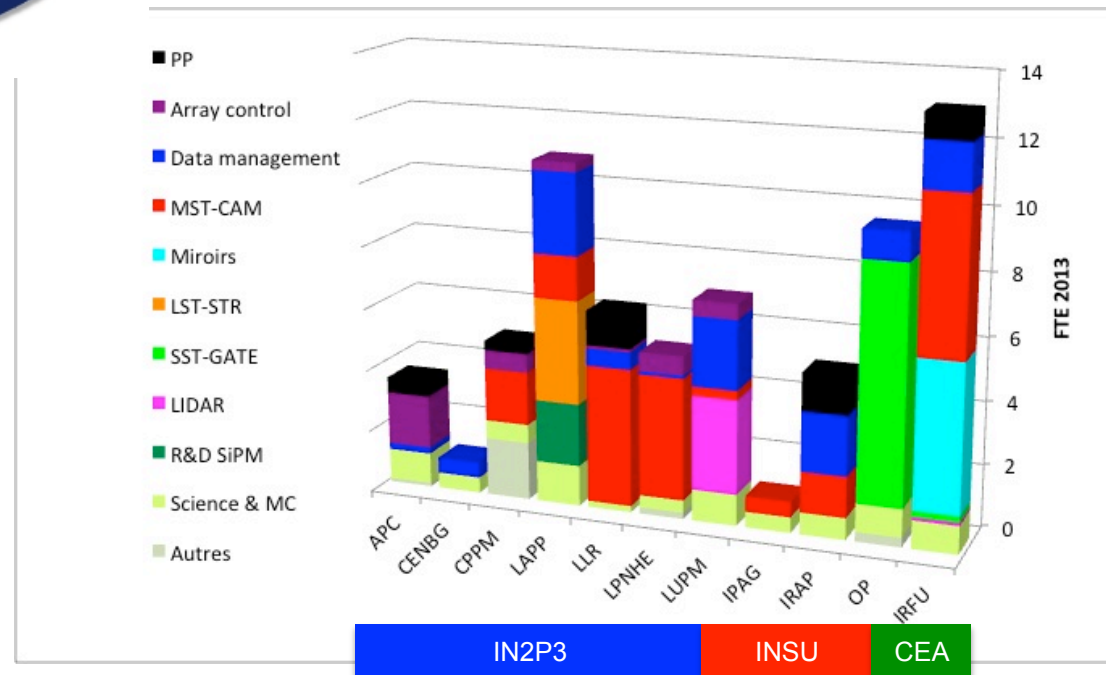
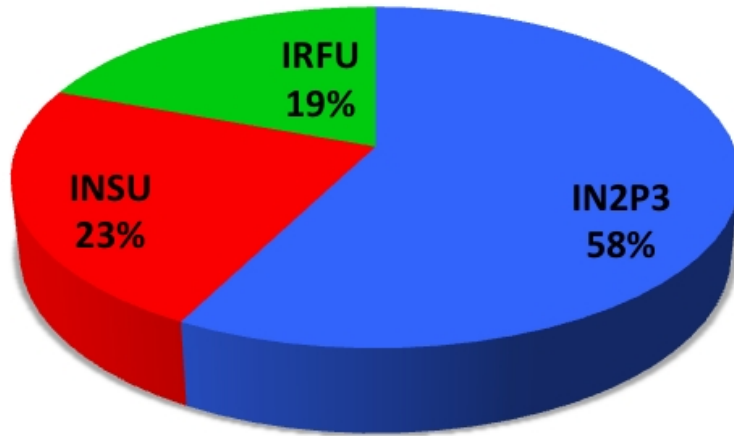
# French Activities



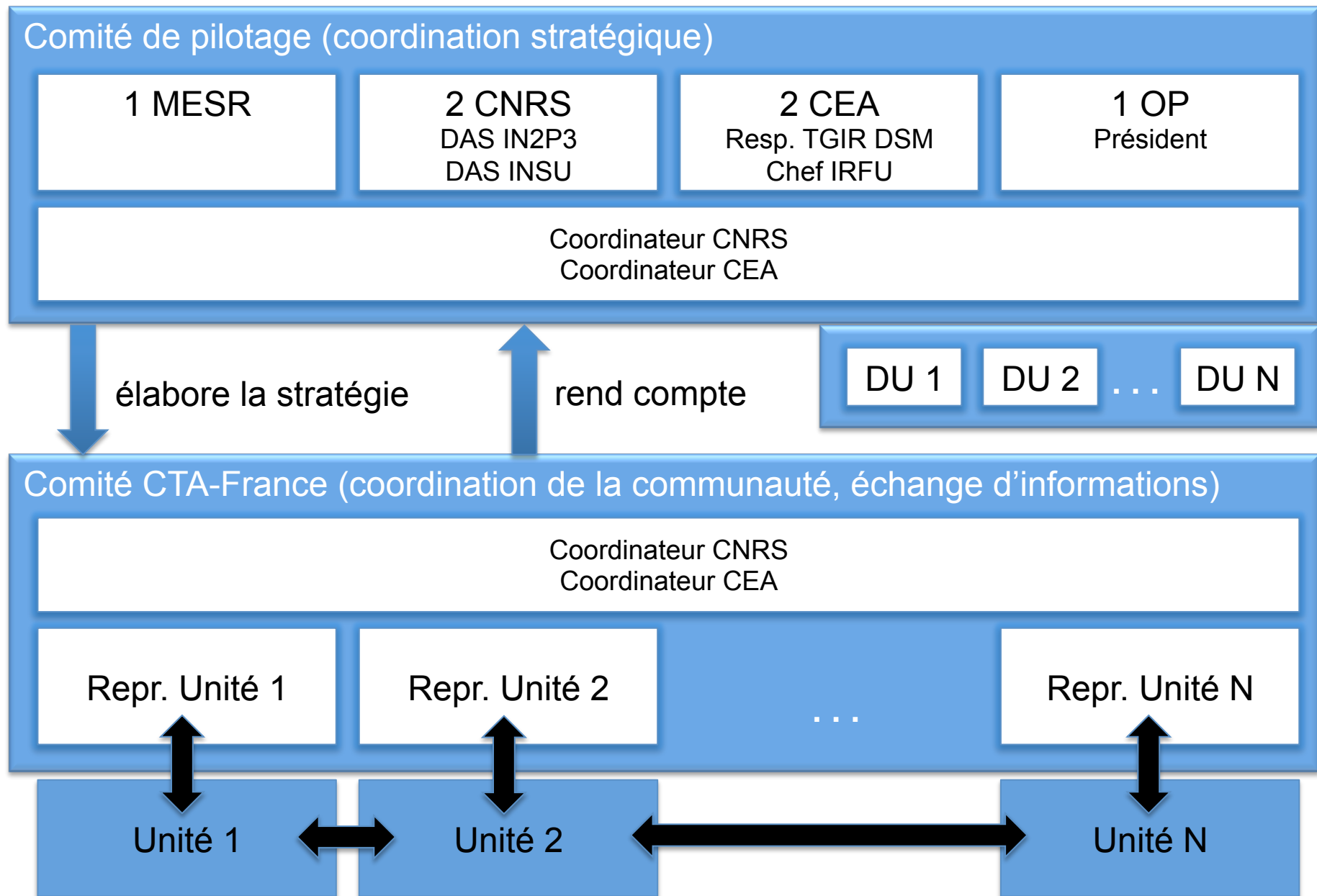


# French Human Resources (2013)

FTE (2013)



# French Project Organization





# Presentations

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The CTA Science Case – Michael Punch (APC)

NectarCAM – François Toussenel (LPNHE)

CTA Data Management – Giovanni Lamanna (LAPP)

Further developments – Giovanni Lamanna (LAPP)

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Backup slides after this slide

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