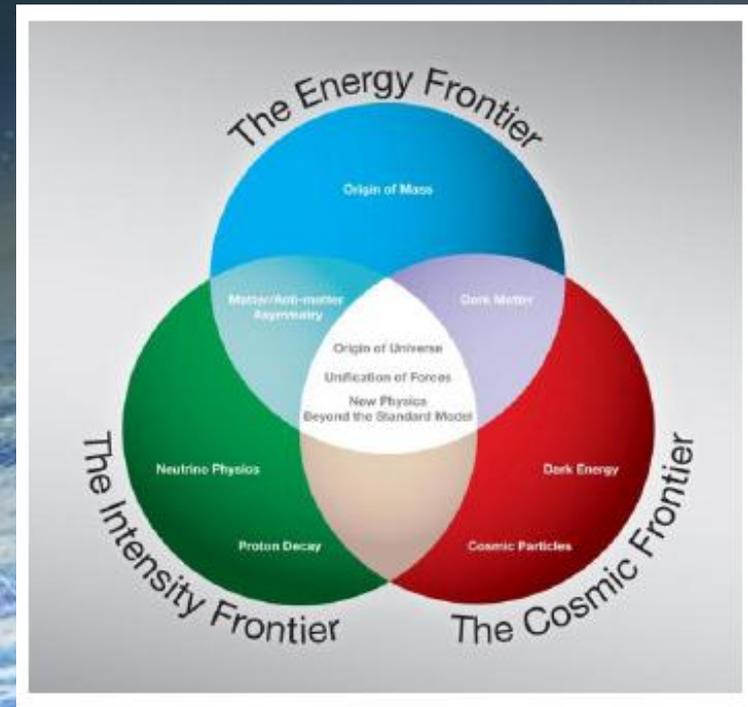


The Pierre Auger Observatory

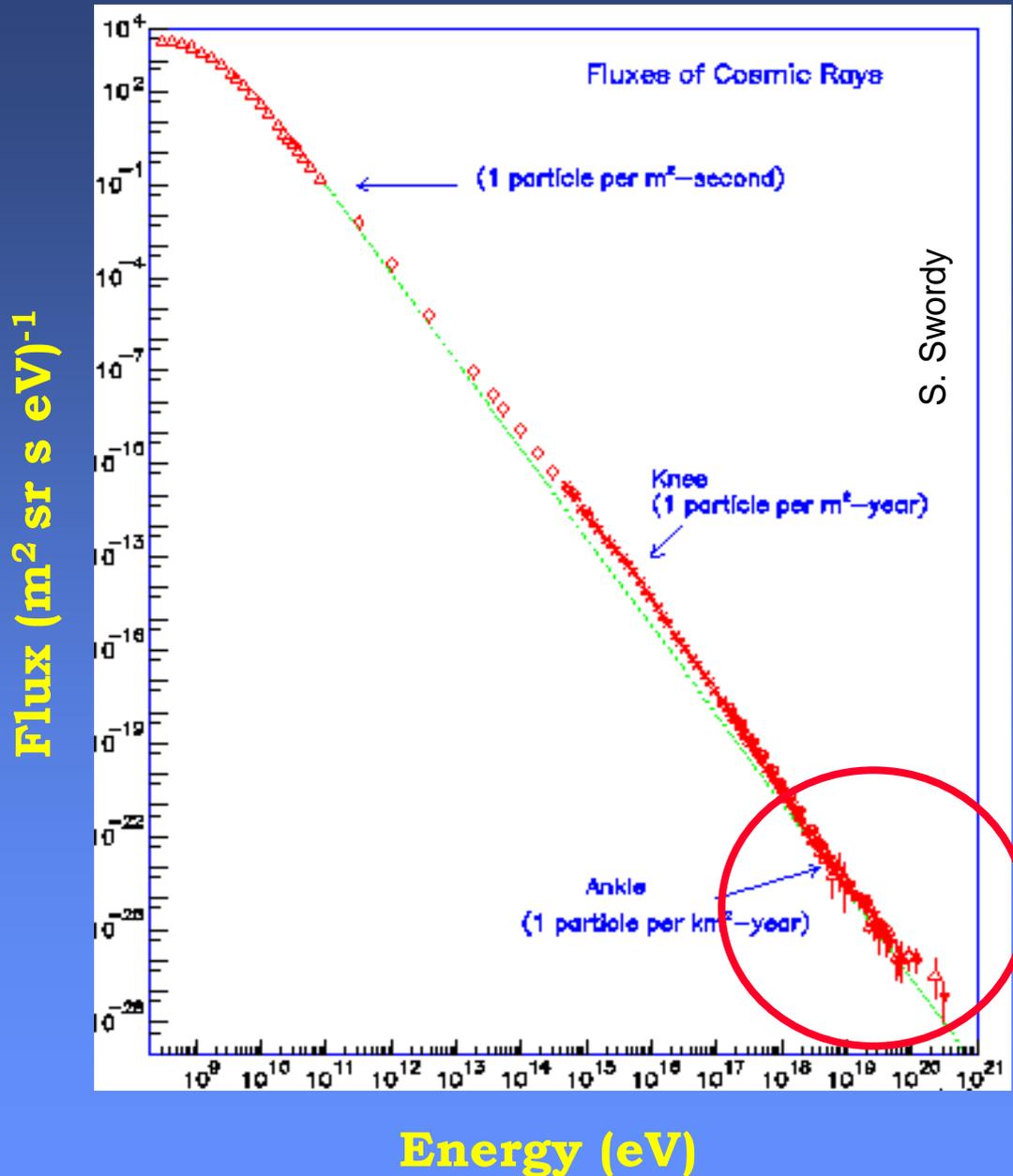
***Another window to the cosmos
built by a unique
international partnership***

***..to learn about the sources
and nature of the
highest energy cosmic rays***

***What is the Auger Observatory?
How is it organized?
What did we learn about
International collaborations?***



Cosmic Ray - Spectrum



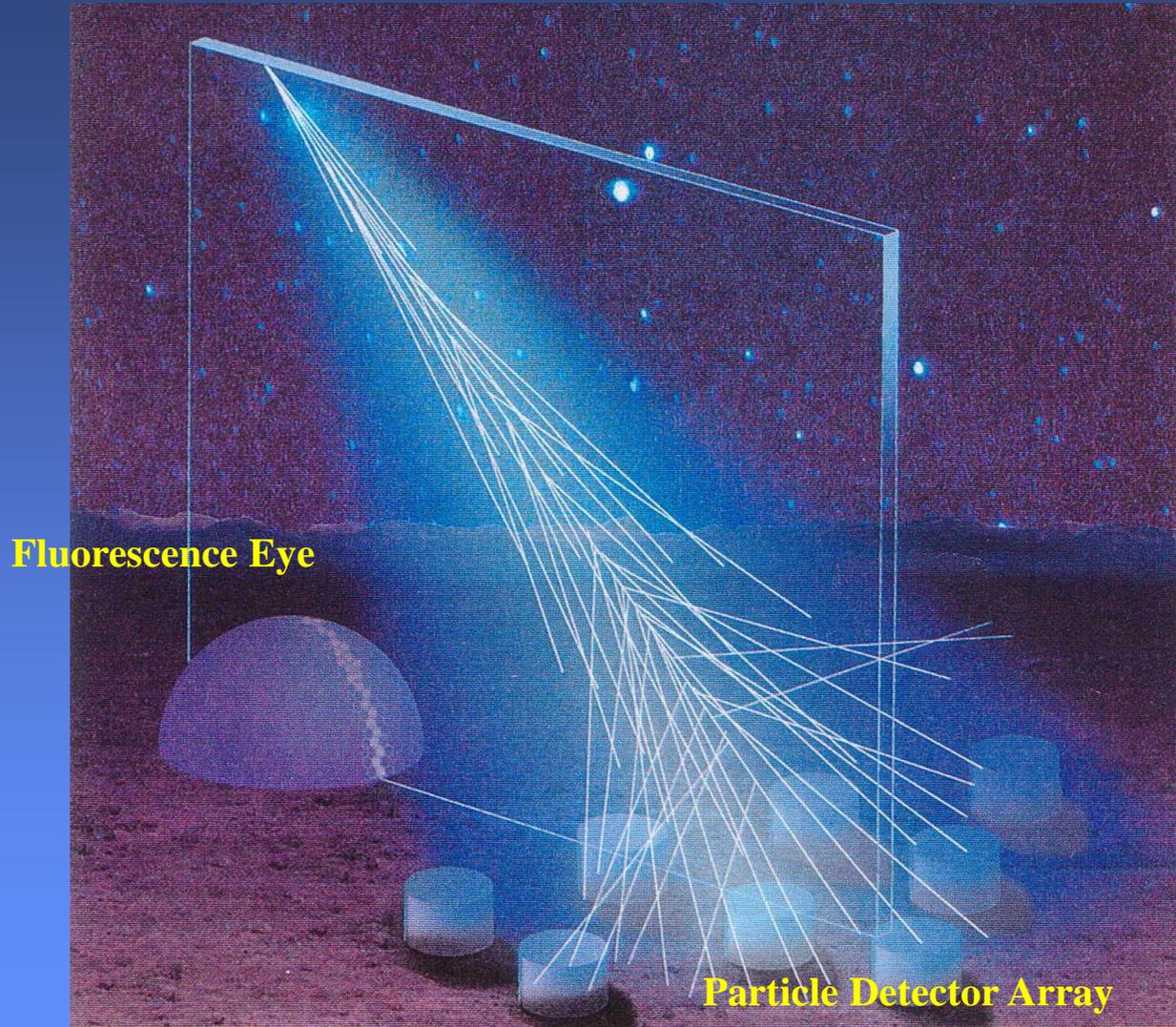
Auger Coverage

$E_{\text{lab}} > 10^{17}$ eV

$E_{\text{CM}} > 14$ TeV

The Auger Observatory

Surface detector array + Air fluorescence detectors



The Auger Observatory

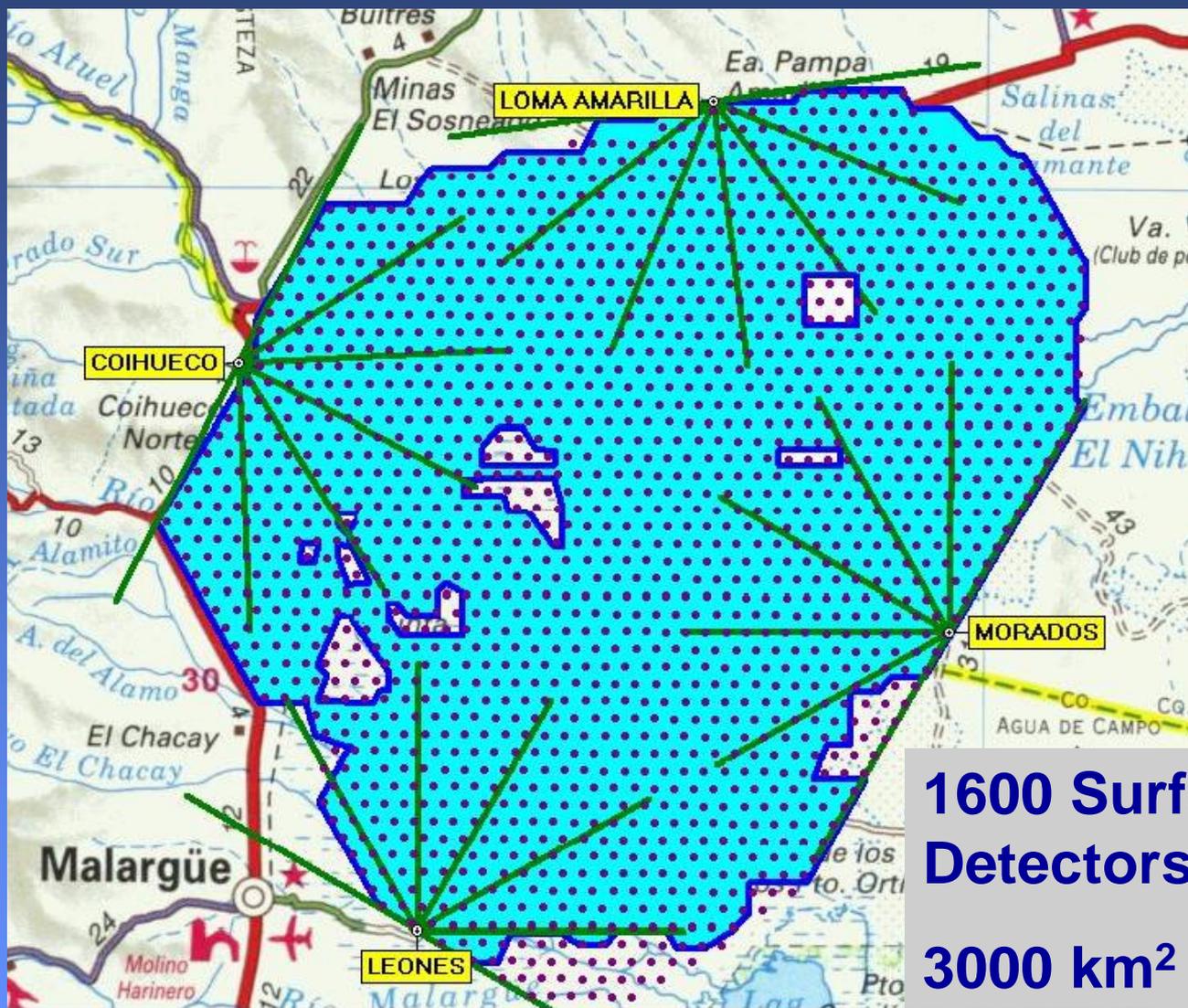
Surface detector array + Air fluorescence detectors



Fluorescence Eye

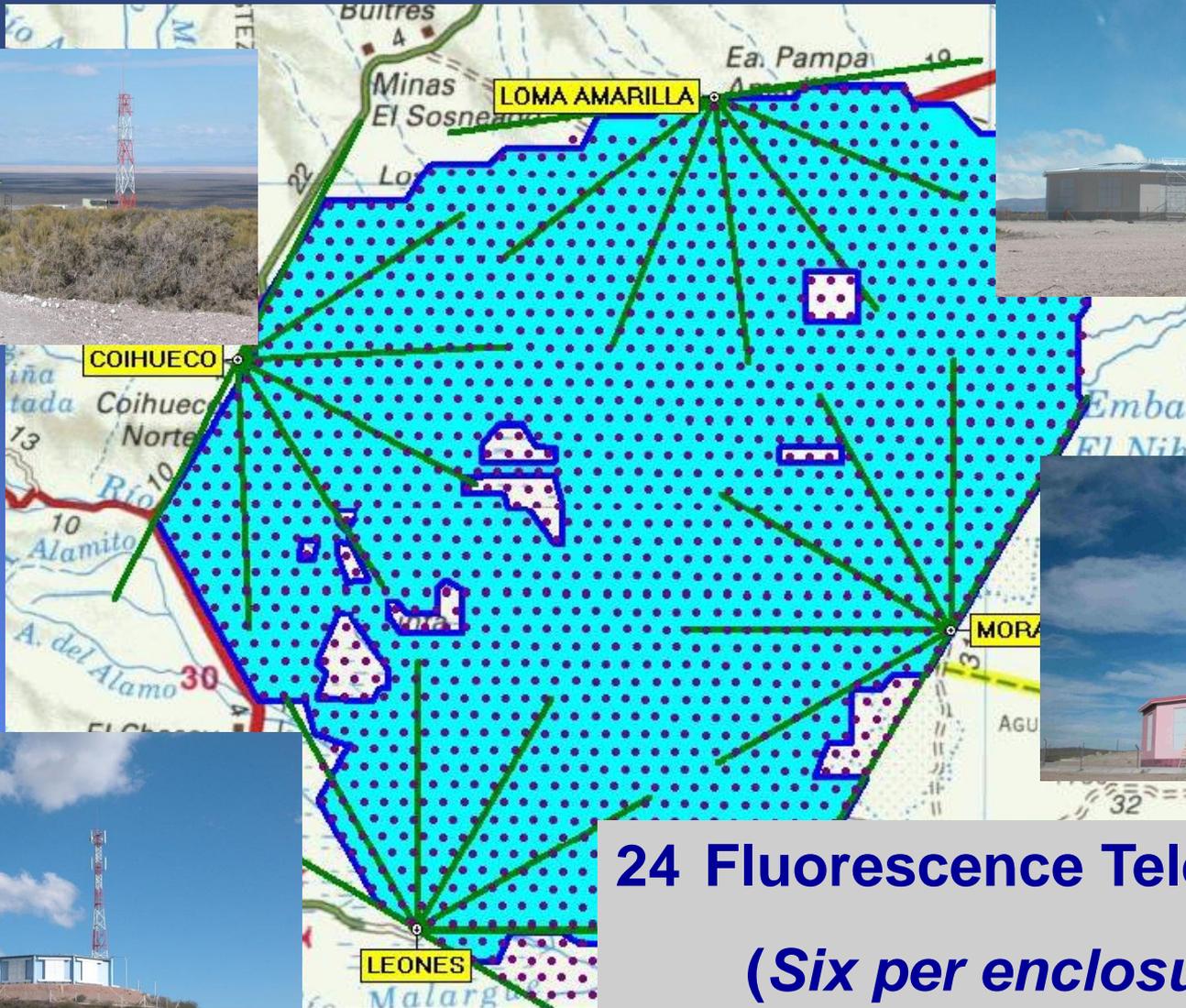
Particle Detector

The Auger Observatory



1600 Surface
Detectors
3000 km²

The Auger Observatory



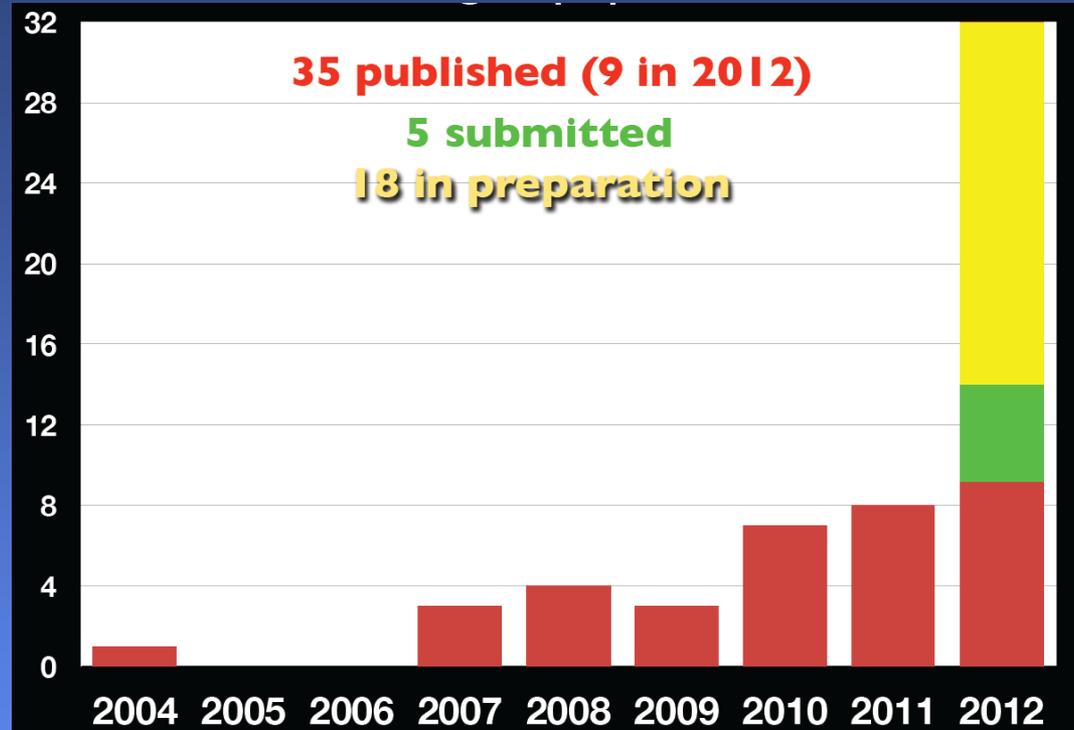
24 Fluorescence Telescopes
(Six per enclosure)

Impact

35 Full Author List Publications

Another 23 papers in the pipeline

>2300 Citations
(Inspire)



Training physicists –

177 PhDs awarded for work on Auger

170 PhD students in the pipeline

The Auger Collaboration

18 Countries, 92 Institutions, 470 Collaborators



Argentina
Australia
Brazil
Croatia
Czech Republic
France
Germany
Italy
Mexico

Netherlands
Poland
Portugal
Romania
Slovenia
Spain
United
USA
Vietnam*

* associate

**True International
Partnership –**

by non-binding agreement -

***No country, region or
institution dominates***

International Agreement

A simple 12 page agreement to work together to build the Auger Observatory – *not a legally binding document!*

Commitments

Organization and Responsibilities

Funding

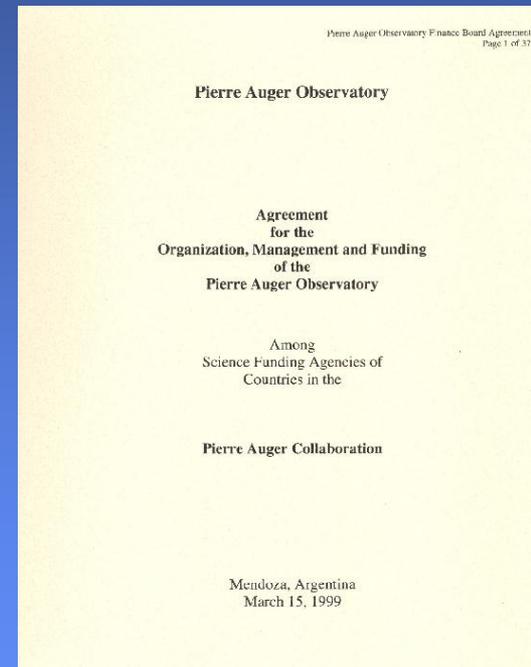
Data rights

Reporting

Liability

Ownership

Withdrawal



October 1998 – International Agreement

finalized and approved at UNESCO, Paris

March 1999 – First signatures, Mendoza, Argentina

Some Project Milestones

August 1991 – Concept of a Giant Array Project
ICRC Dublin, Ireland

February-July 1995 - Design Workshop at
Fermilab – all collaborators – design report

September 1995 – Site selected in Argentina

October 1998 – International Agreement
finalized and approved at UNESCO, Paris

March 1999 - Signing of the International
Agreement, Mendoza, Argentina

March 1999 - Inauguration of the Observatory,
Malargüe, Argentina.

December 2001 - First hybrid Event
(Engineering Array complete)

January 2002 – construction starts

August 2005 – First results

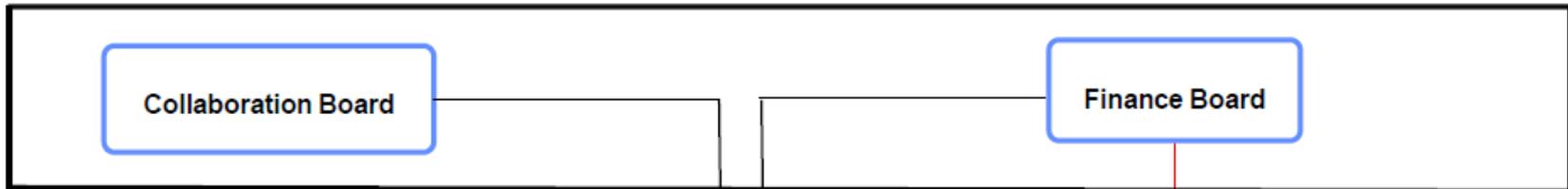
June 2008 – Observatory complete

June 2008 – present – Data taking

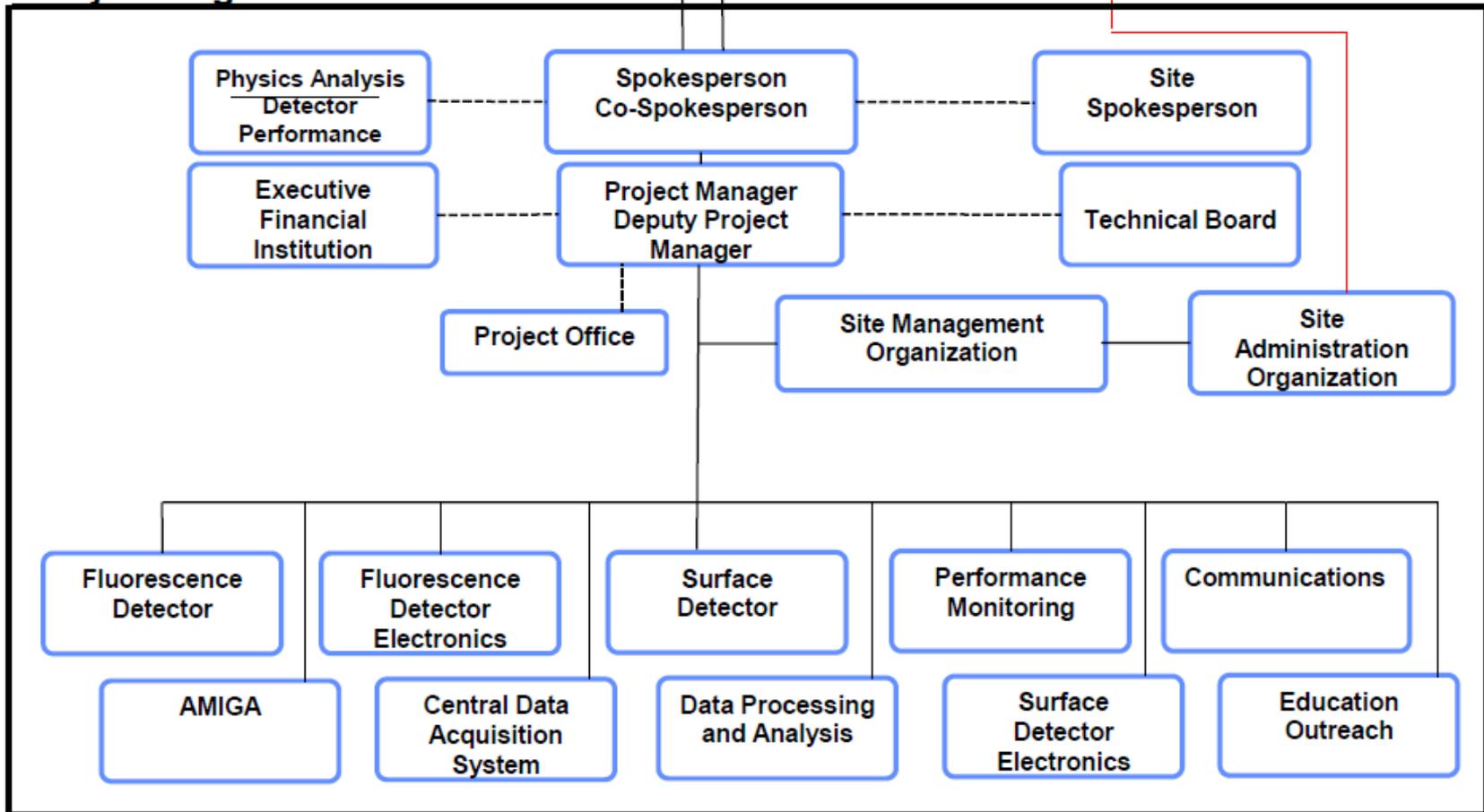


Organization

Project Oversight



Project Organization



Finance Board

Oversight body for project finances.

Membership:

Representatives of Auger Project Funding Agencies or their designees

Role:

Provide international funding oversight

Monitor costs and funding

Approve operating budgets

Collaboration Board

Oversight body for project scientific and technical activities

Membership:

Nominally one representative per institution

Role:

Scientific policy

Publication policy

Membership

Monitor operations

Site Administration Organization

Fundación Pierre Auger Argentina

(FOPAA)

Foundation formed in Argentina by members of the Auger collaboration to act as legal agent for the Auger Observatory. Operates by agreement with the Auger Finance Board.

Responsibilities:

- Employ Observatory staff**

- Process staff salaries**

- Hold and disburse funds for Observatory operations**

- Maintain legal requirements for accounting, taxes and social services**

- Obtain legal and accounting services as needed**

Site Management Organization

Operates and maintains the Observatory –
headed by the Site Manager



Responsibilities:

- Routine maintenance of detector systems
- Maintenance of buildings and infrastructure
- Support of Task Groups
- Serve as point of contact with land owners
and local government officials
- Contracts for operations
- ES&H for staff and visiting collaborators

Funding

Construction

Total cost – Auger South - \$53M

Contributions from counties - 80% in-kind - 20%

Common fund – nominally for photomultiplier tubes

No contribution exceeds 25%

Contributions from each institution defined in an MOU

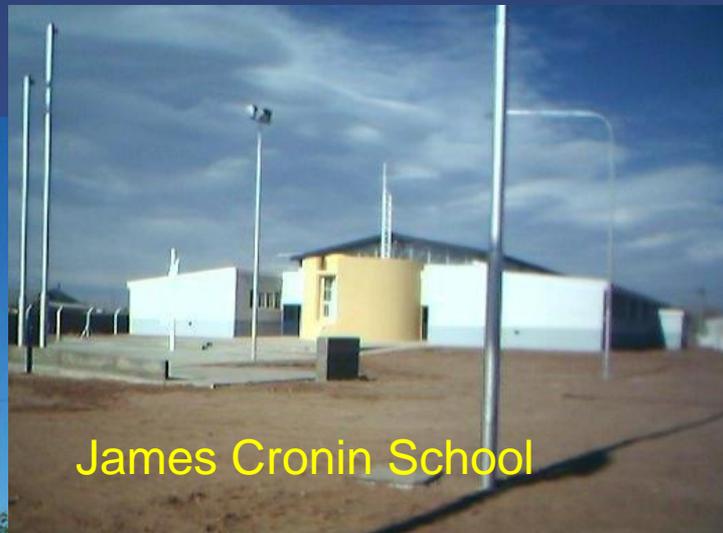
Operations

Contributions to operating costs based on the number of authors on scientific papers.

Support of operations and maintenance by each institution defined in an MOU for Operations.

Outreach

Auger Office Building
And Visitor Center
>74,000 visitors



James Cronin School



Malargüe
Planetarium



Auger collaboration on parade

Auger Summary

What did we learn about international partnerships?

Auger is a successful international partnership – a beneficiary of a tradition of scientific cooperation.

Simple international agreements can be effective.

It is necessary to have partnership from the beginning – everyone at the table – all partners equal.

The design was a common effort – no national flag on any component.

Oversight by funding agencies working together by consensus.

Auger Summary

What did we learn about international partnerships?

Maximize in-kind contributions for construction.

Civil construction has to be by host country.

Governments are becoming more flexible in funding international collaborations.

Elaborate management tools (eg EVMS) cannot be imposed on partners (different accounting systems – different approaches to contingency).

Auger Summary

Benefits and risks of International Partnerships

Risks and responsibilities

Partners may not deliver everything as economies of partner countries change over time.

Partnerships imply a continuing commitment – cannot just walk away.

Benefits

Greatly expanded access to financial support

Broader intellectual participation

Leverage the scientific reach of experiments

Strengthen the scientific enterprise worldwide