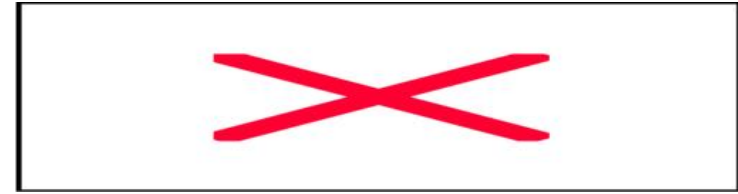


ANIBAL GATTONE

www.retina.ar

Presented at the CAN Symposium, December 2, 2004

ARGENTINA



Population

~39m

GDP per cápita (PPP)

\$11,200

US

\$37,800

China

\$ 5,000

% below poverty line

51

US

12

China

10



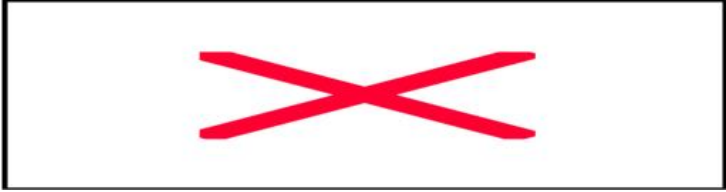
Public universities	38
Private universities	45
Enrollment	1,2m
PhD degrees/yr	500
Fixed telephone lines	9m
Mobile phone lines	10m
Internet hosts	1m
Internet users	7m
Broadband users	400k



**BASIC SCIENCE: The PIERRE AUGER
Observatory**

**HEALTH SCIENCE: Tele-microscopy and
tomography to study diseases**

**APPLIED SCIENCE: Improving the Fruit
Industry**

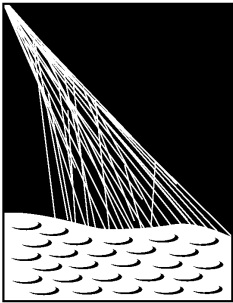
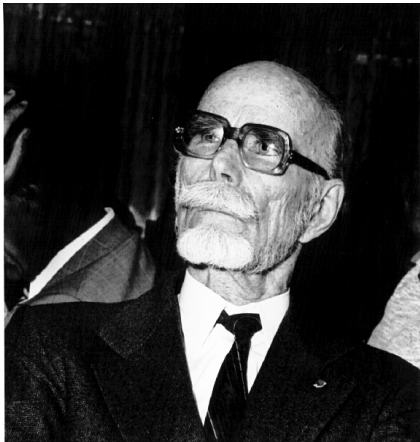


BASIC SCIENCE: The PIERRE AUGER Observatory

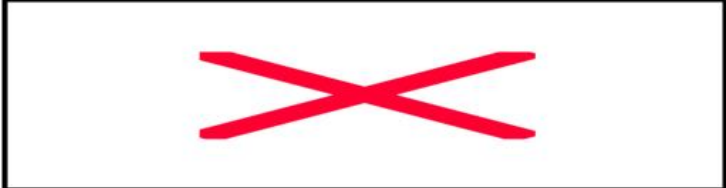


Malargüe, Mendoza

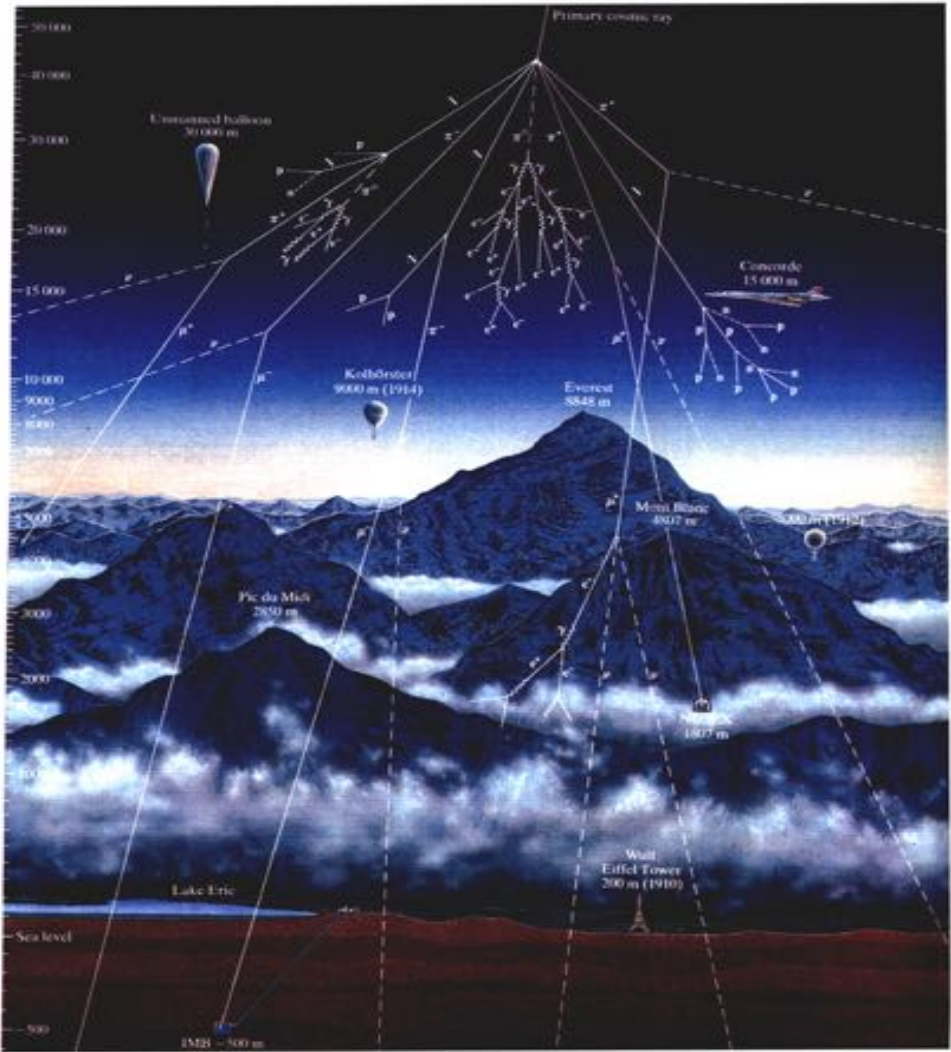
An International Facility
to Study the Highest Energy Cosmic Rays



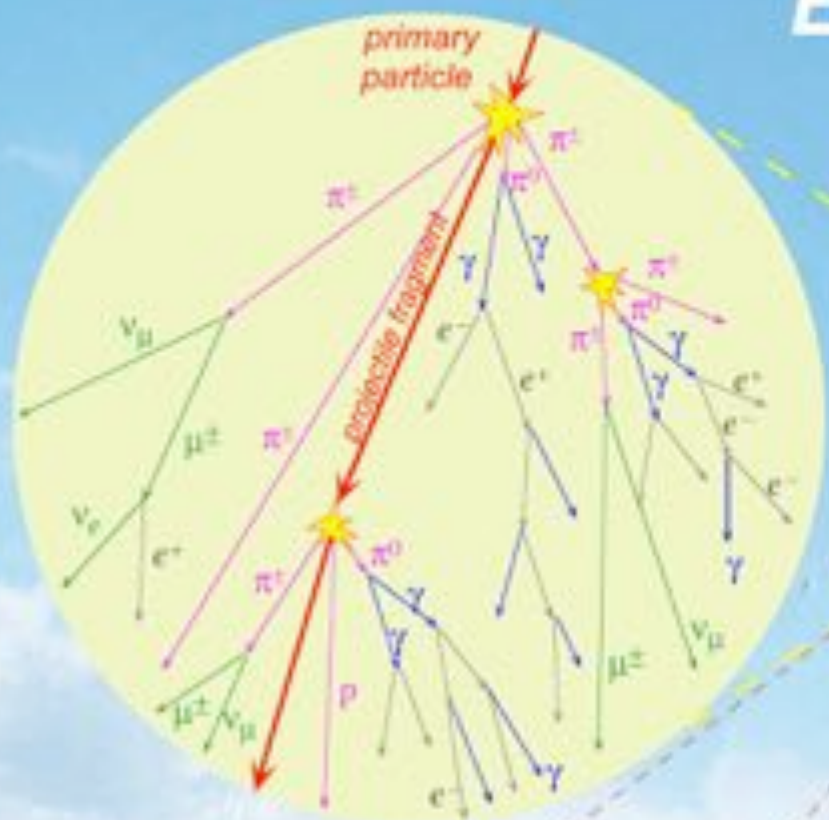
**PIERRE
AUGER**
OBSERVATORY



PIERRE AUGER Observatory

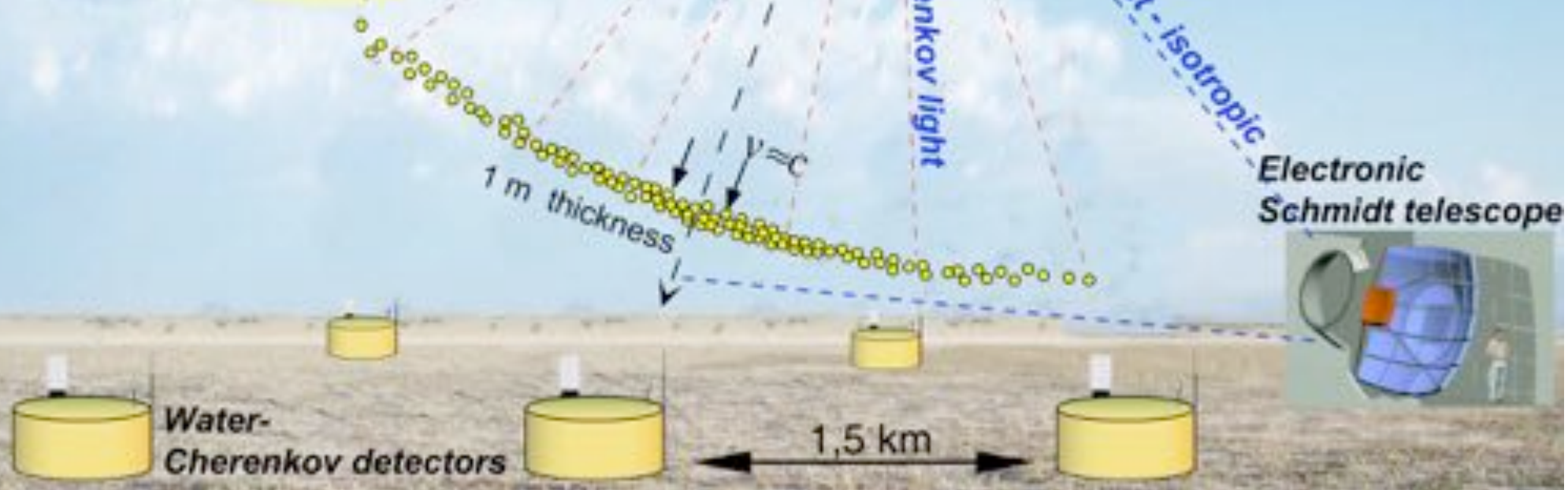


Extended Air Showers



primary particle

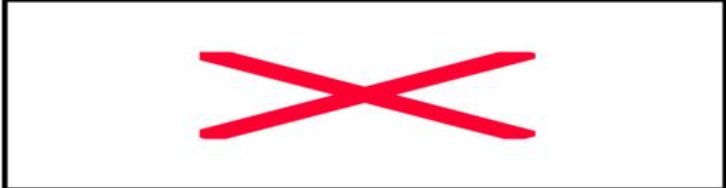
Pierre Auger Observatory:
 $10^{19} \text{ eV} < E < 10^{21++} \text{ eV}$



Water-Cherenkov detectors

1,5 km

Electronic Schmidt telescope



PIERRE AUGER Observatory

FermiLab USA

Lyon FRANCE



Malargüe ARG

Shower and fluorescence data collected at Malargüe

Through RETINA sent to repositories in Lyon and Fermilab

Scientists in the 19 collaborating countries retrieve data from the repositories

When fully operating (1600 tanks and 4 fluorescence stations) will be producing some 10 GigaBytes/day of data



HEALTH SCIENCE: Telemicroscopy



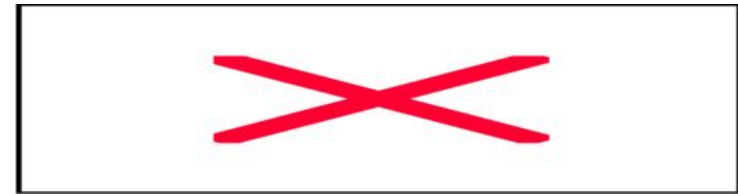
Francisco Capani and Héctor Coirini

Projection of a series of optical sections
through a Purkinje neuron

NEURAL CONNECTIONS IN ASPHYCTIC BABIES

School of Medicine (UBA, Buenos Aires)
and National Center for Microscopy and
Imaging Research (UCSD, USA)

*NCMIR and National Partnership for
Advanced Computation Infrastructure
both in the USA developed Telescience a
set of tools for end-to-end tomography
and remote microscopy*



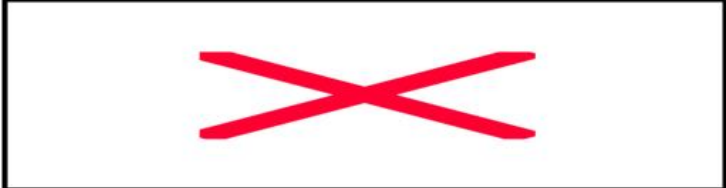
The Telescience Architecture is Layered



Layers are modular, allowing for extension of each layer without disrupting the entire system

Every Layer has its own complexity and administration that was previously passed on to the end-user

Telescience Portal centralizes all administrative details of each layer into a single username and passphrase



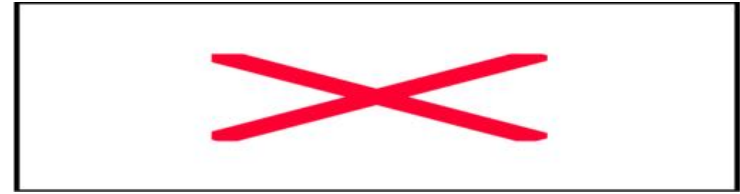
APPLIED SCIENCE: The Fruit Industry

Operational Planning and Processing under Uncertainty in the Fruit Industry

ALBERTO BANDONI, PLAPIQUI, Bahía Blanca

The High Valley of Río Negro and Neuquén in Argentina, spanning two provinces at the southwest of the country, is the area where apples and pears are grown.





∞ The region has been traditionally one of the world main fresh-fruit and concentrated-juice producers.

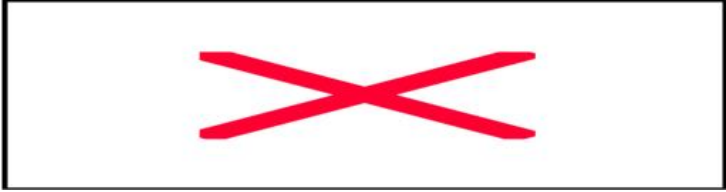
Fruit Industry:
US\$700.000.000 / year of export value



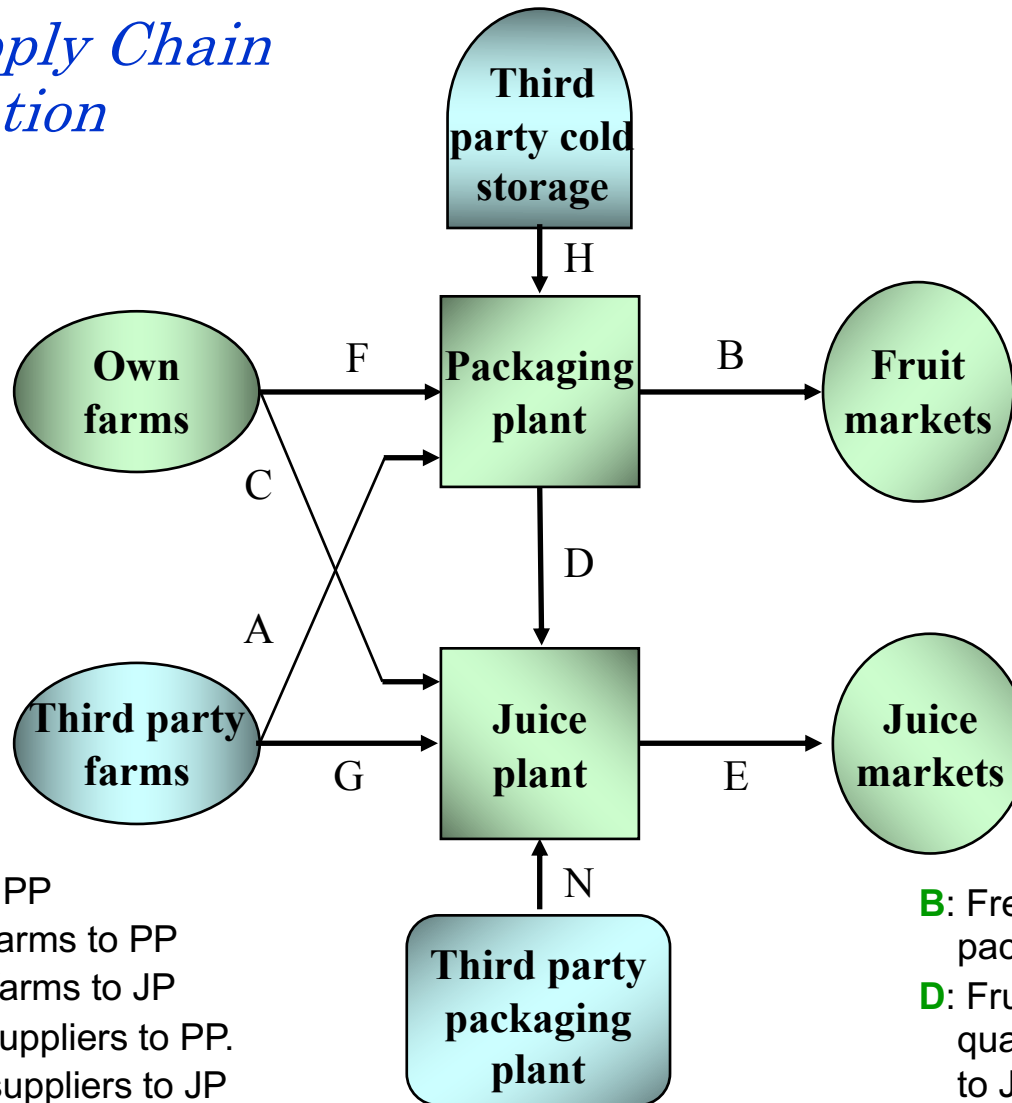
Apples:
10.086.000 tn

Pears:
520.000 tn





HV Fruit Supply Chain Description



H: Fruit from storage to PP

F: Fresh fruit from own farms to PP

C: Fresh fruit from own farms to JP

A: Fresh fruit from fruit suppliers to PP.

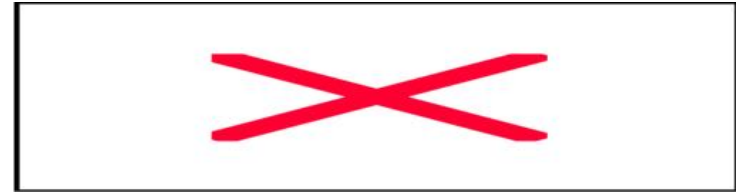
G: Fresh fruit from fruit suppliers to JP

N: Fruit from supplier's PP.

B: Fresh fruit prepared and packed in different ways.

D: Fruit from PP that do not fulfill quality specification transferred to JP

E: Product streams of Concentrate Juice of 72°Brix and aroma.



Joseph F. Pekny

Professor (1990)

**Batch Scheduling,
Parallel Computing
Methods,
Combinatorial
Optimization,
Nonlinear Optimization**

•Ph.D Carnegie Mellon
University, 1989

•B.S. Princeton University,
1985



Gintaras V. Reklaitis

*Professor and Head of the
School (1970)*

**Process Systems
Engineering, Computer
Aided Process Operations,
Batch Process Design,
Scheduling and Analysis**

•B.S. Illinois Institute of Technology,
1965

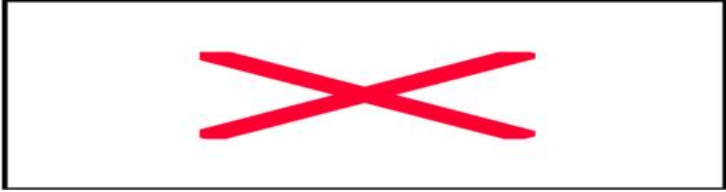
•M.S. Stanford University, 1969

•Ph.D Stanford University, 1969

PURDUE
University



- ❖ **Numerical solution of large systems of equations interactively running at both ends.**
- ❖ **Videoconferencing over results and future strategies.**



Thank you!