

The Importance of ILC Communications

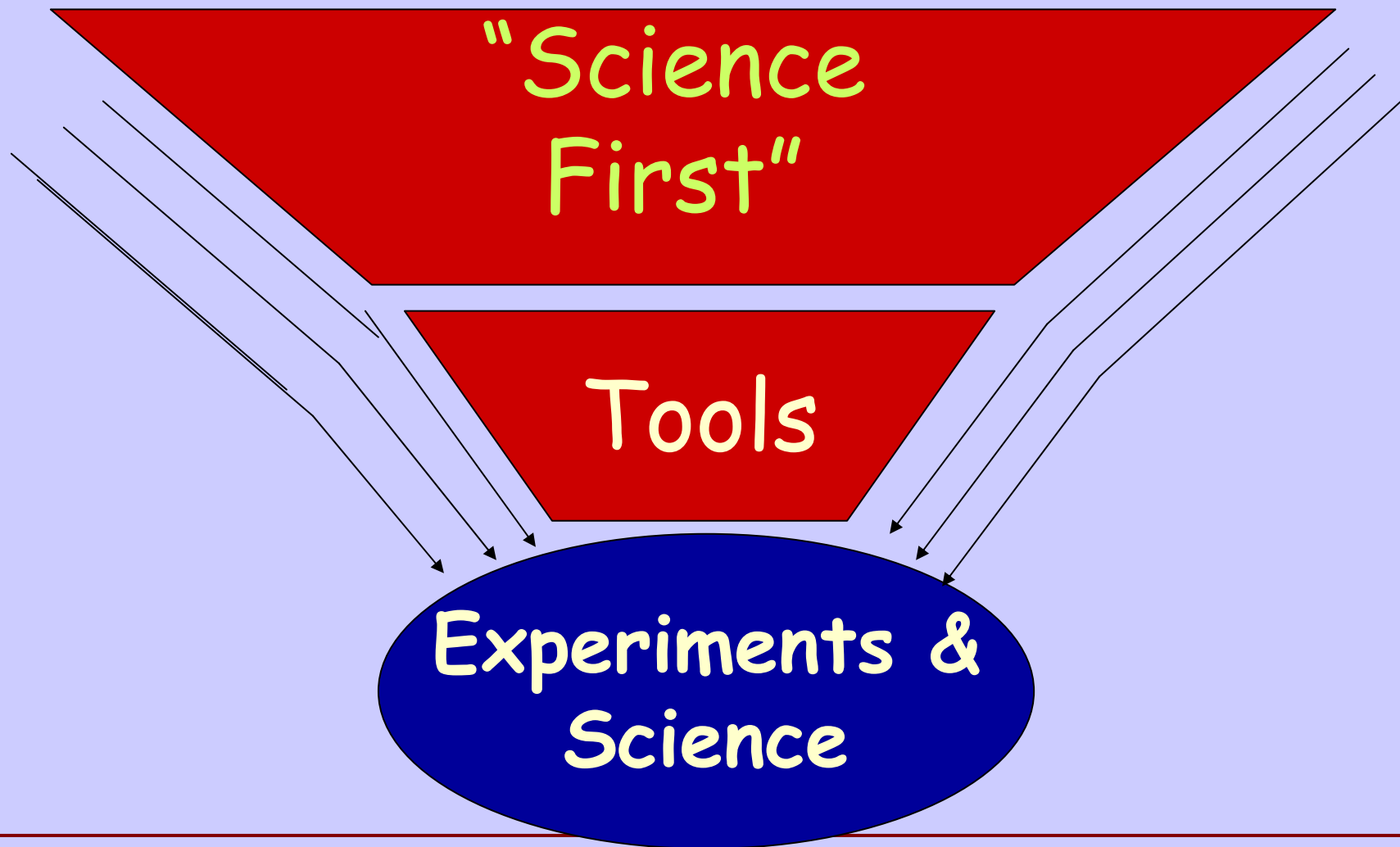
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Communications Workshop
VLCW06
17-July-06

ILC Communications

- **We must communicate the ILC story very effectively if we are to succeed with this ambitious undertaking**
 - We must convince our colleagues in HEP; the broader scientific community; the funding agencies; policy makers and the general public of the reasons for and benefits of building the ILC
 - The communications program must be totally INTERNATIONAL
 - TOOLS: We will need hand-out materials; talk materials; write articles; make personal presentations, etc.
 - Our “campaign” will begin in earnest when the ILC Reference Design is released early next year. It must be aimed at communicating the excitement and value of the project, with the goal of making a successful funding proposal in about 2010
- **So, what's the ILC story we want to tell ???**
 - Our story is the same at all levels! The level of detail is different.

The Elements of our Story

Begins and ends with the Science



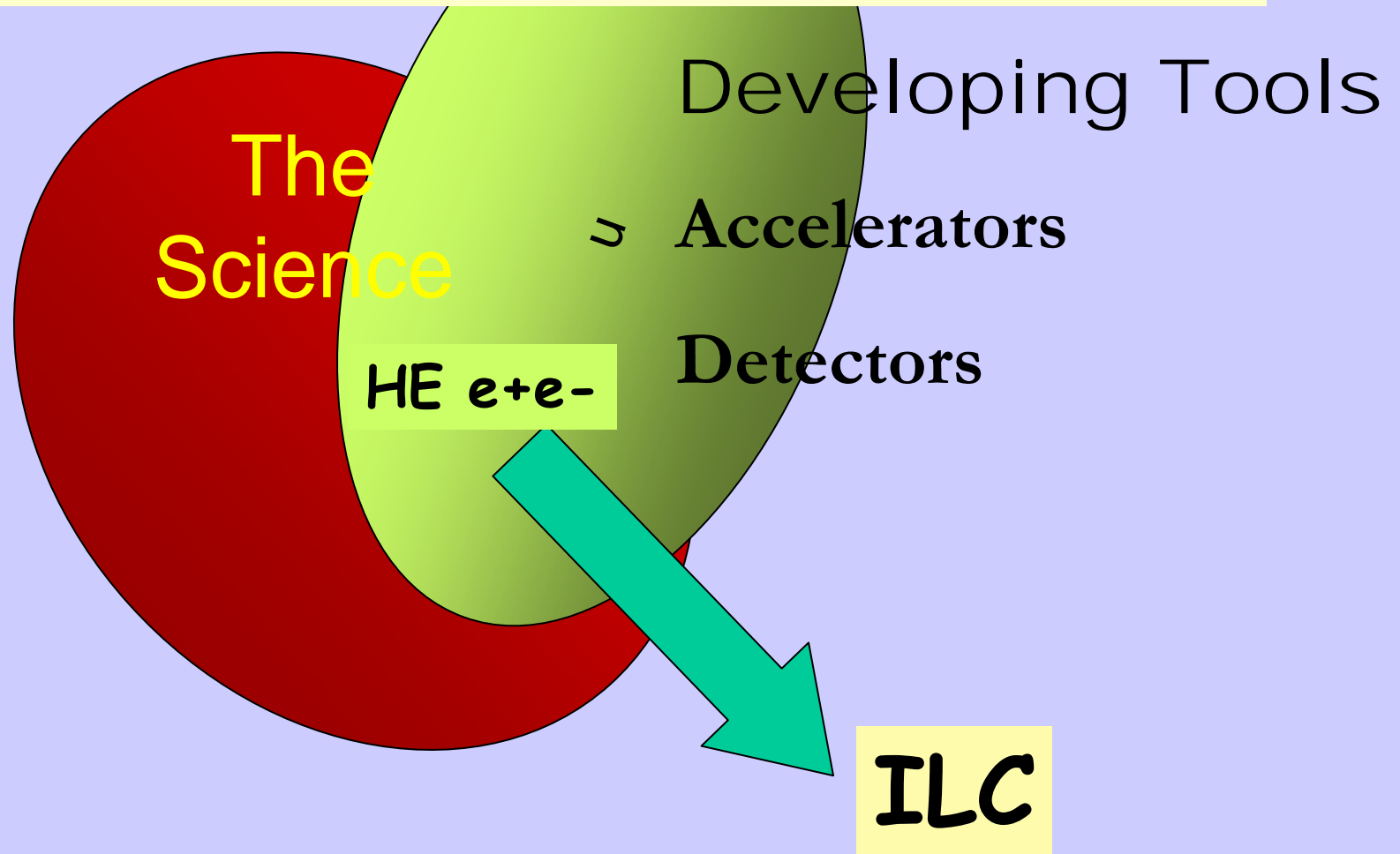
The Science of Particle Physics

Inquiry Based Science

1. Are there undiscovered principles of nature:
New symmetries, new physical laws?
2. How can we solve the mystery of dark energy?
3. Are there extra dimensions of space?
4. Do all the forces become one?
5. Why are there so many kinds of particles?
6. What is dark matter?
How can we make it in the laboratory?
7. What are neutrinos telling us?
8. How did the universe come to be?
9. What happened to the antimatter?

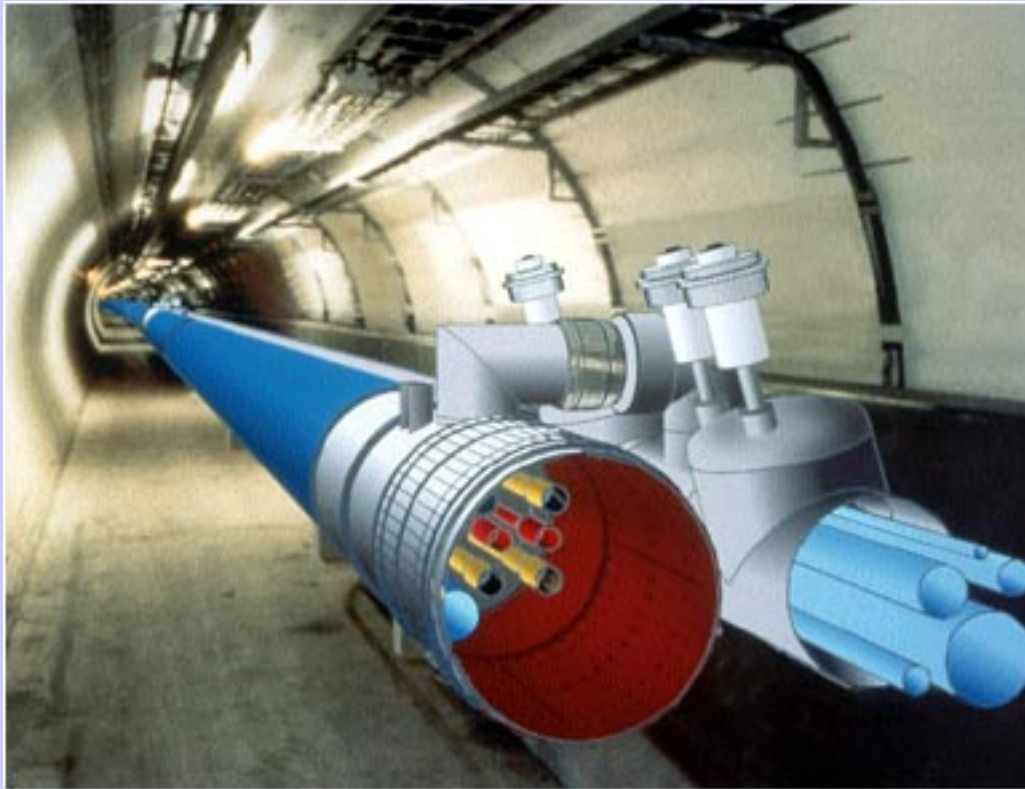
from the Quantum Universe

Our Challenge in the ILC / GDE
*Develop the Accelerator and Detectors
to Address the Science*



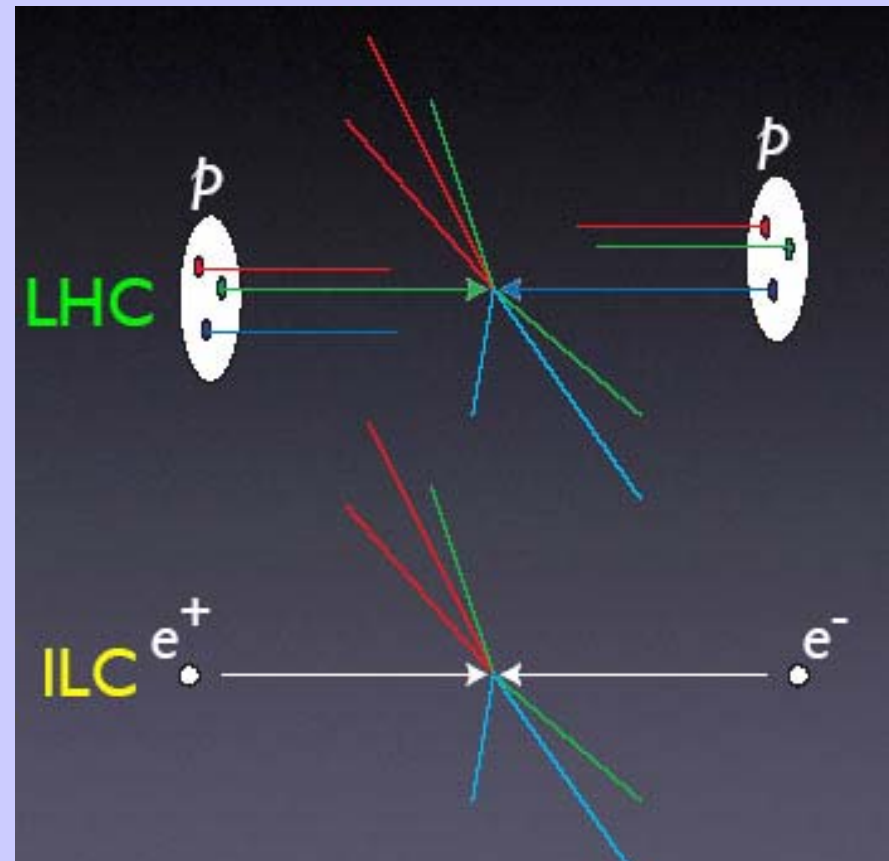
Accelerators at the Energy Frontier

Large Hadron Collider CERN – Geneva Switzerland

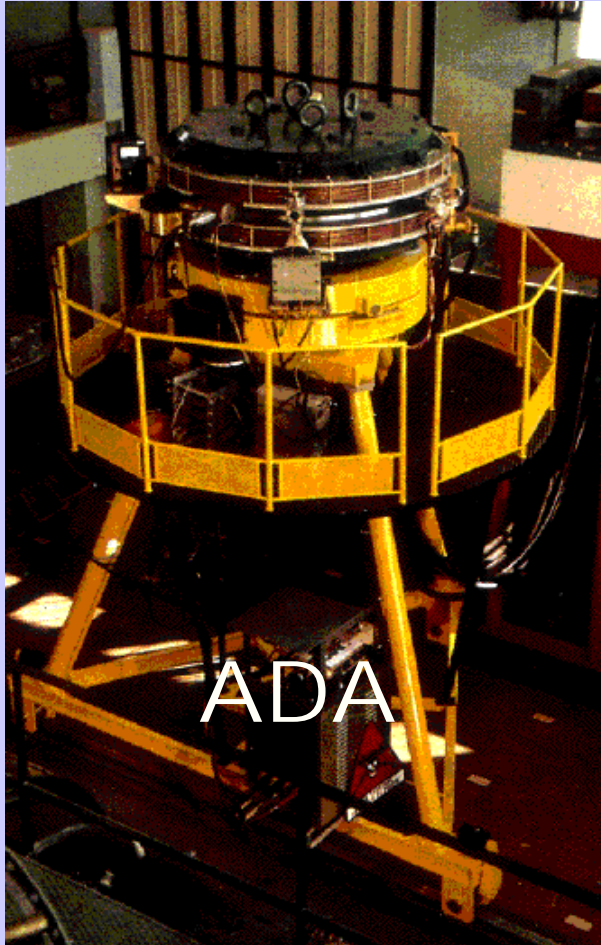


Then, why e^+e^- Collisions ?

- elementary particles
- well-defined
 - energy,
 - angular momentum
- uses full COM energy
- produces particles democratically
- can mostly fully reconstruct events



The Rich History Electron-Positron Colliders

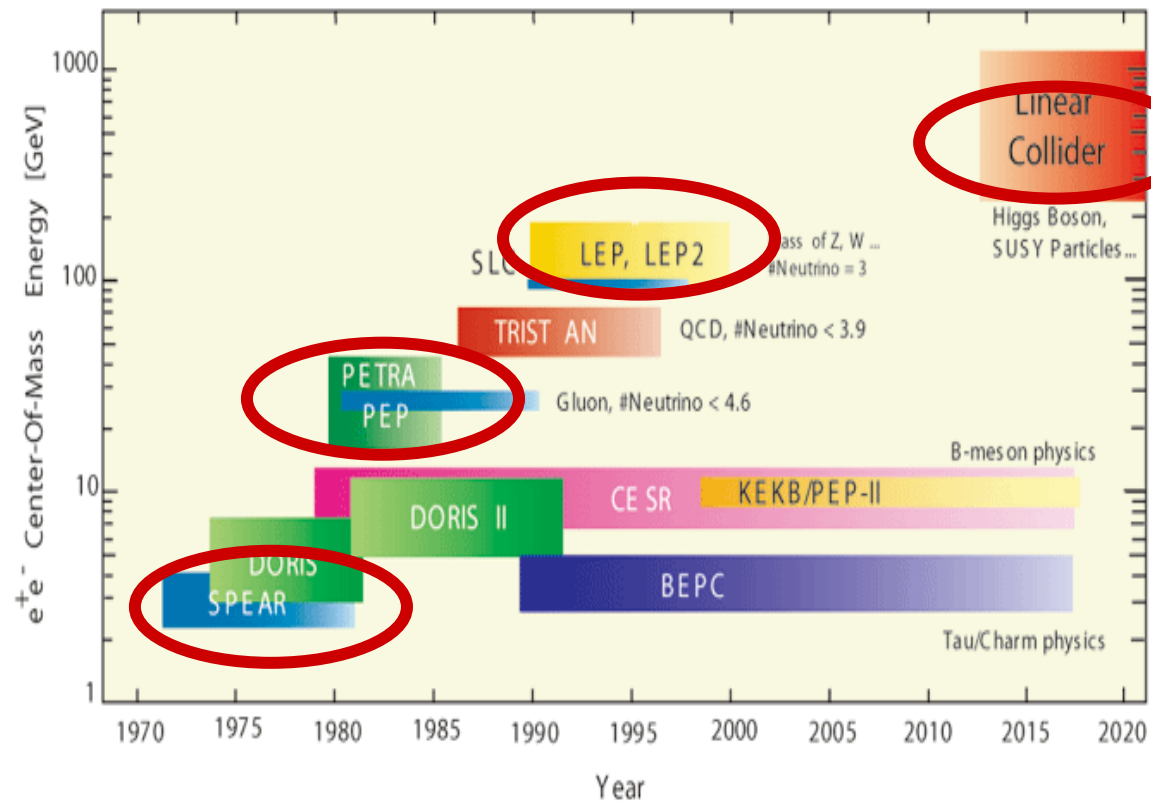


**Bruno Touschek built the first
successful electron-positron collider
at Frascati, Italy (1960)**

Eventually, went up to 3 GeV

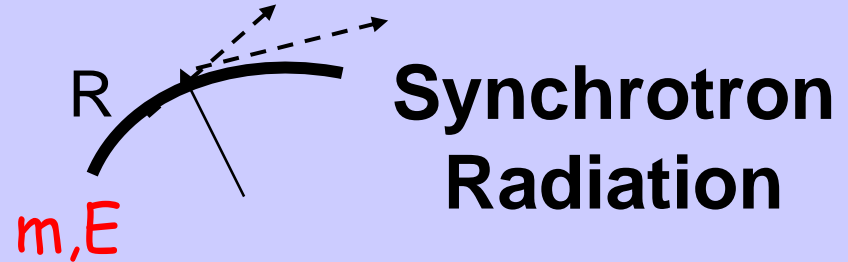
Electron Positron Colliders

The Energy Frontier



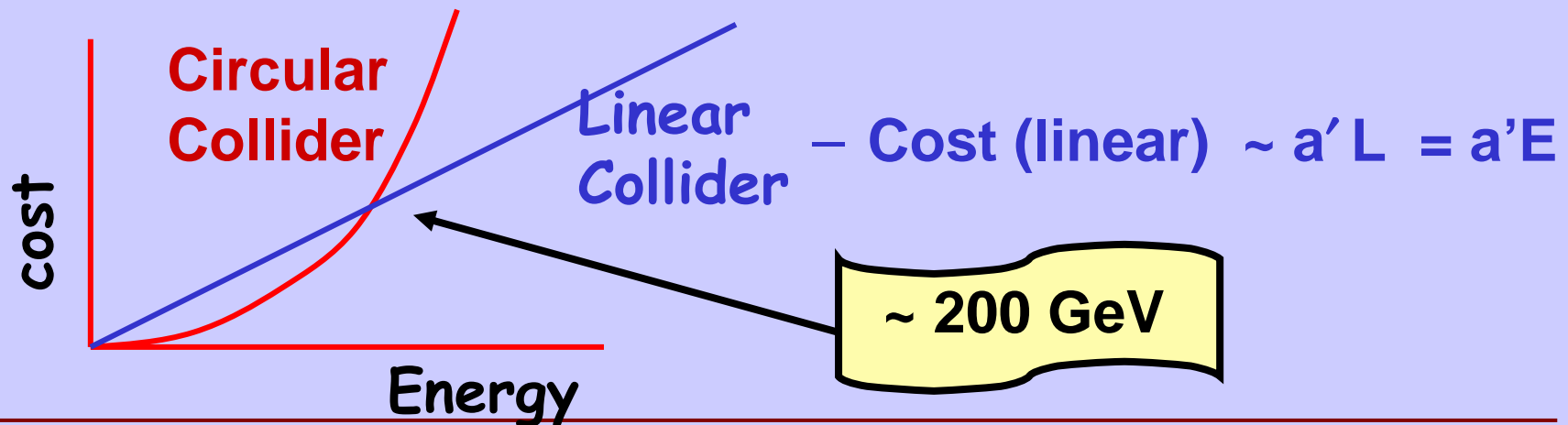
Why a Linear Collider?

- **Circular Machine**

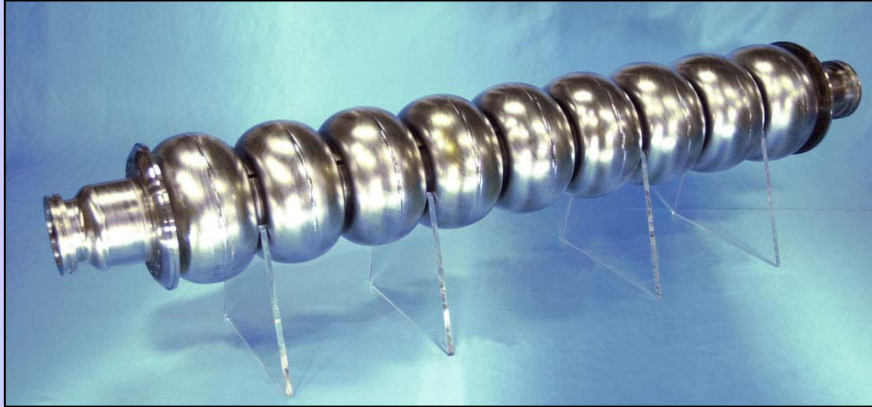


- $\Delta E \sim (E^4 / m^4 R)$

- Optimization : $R \sim E^2 \Rightarrow \text{Cost} \sim c E^2$



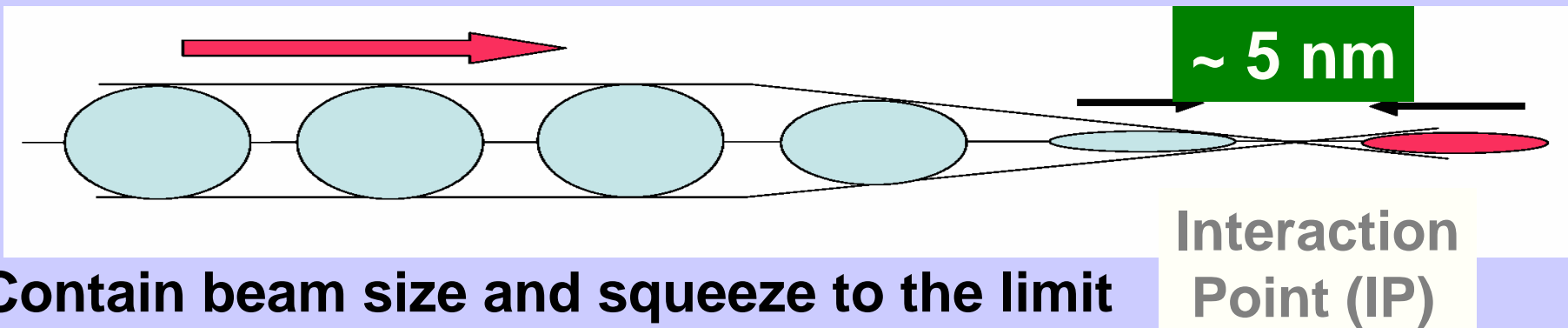
The Technical Challenges and Benefits



Accelerate to high energies

Develop Superconducting RF Accelerator Technology with its many applications to physical and medical science

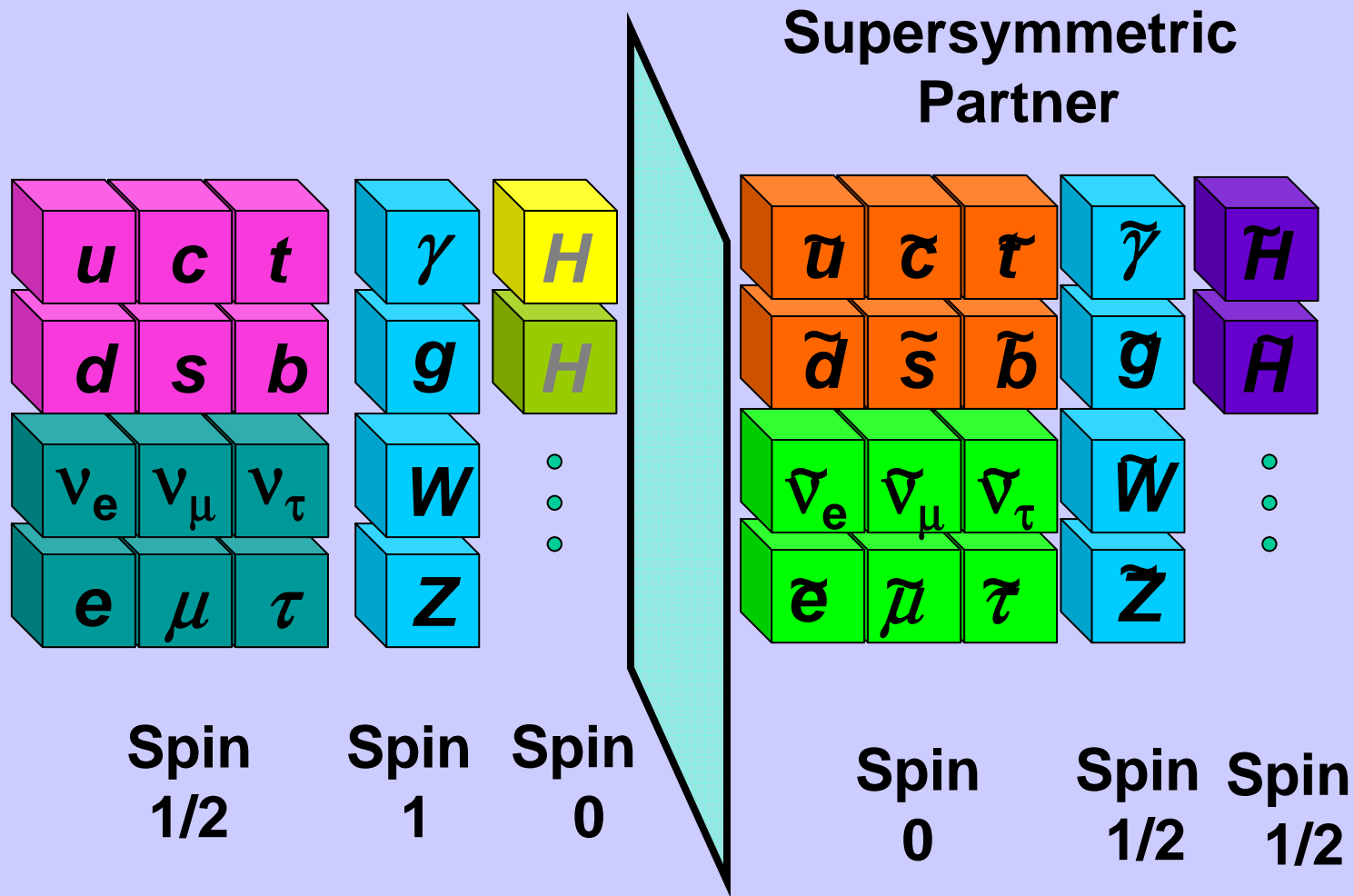
Advanced Beam Dynamics



Contain beam size and squeeze to the limit


The Richness of the Science

Supersymmetry



Is there a New Symmetry in Nature?

Super-symmetry

Bosons  **Fermions**

Integer Spin: 0, 1, ...

Half integer Spin: 1/2, 3/2, ...

The virtues of Super-symmetry:

- Unification of Forces
- The Hierarchy Problem
- Candidate for the Dark Matter

...

Implementation Plan

ILC Communications

- **We have a fascinating and exciting story !**
- **We need a very well-conceived plan for how to convince our target constituencies**
- **We will require excellent materials that are aimed at types and levels of target audience**
- **We need to put together a talented team of advocates to tell our story!**