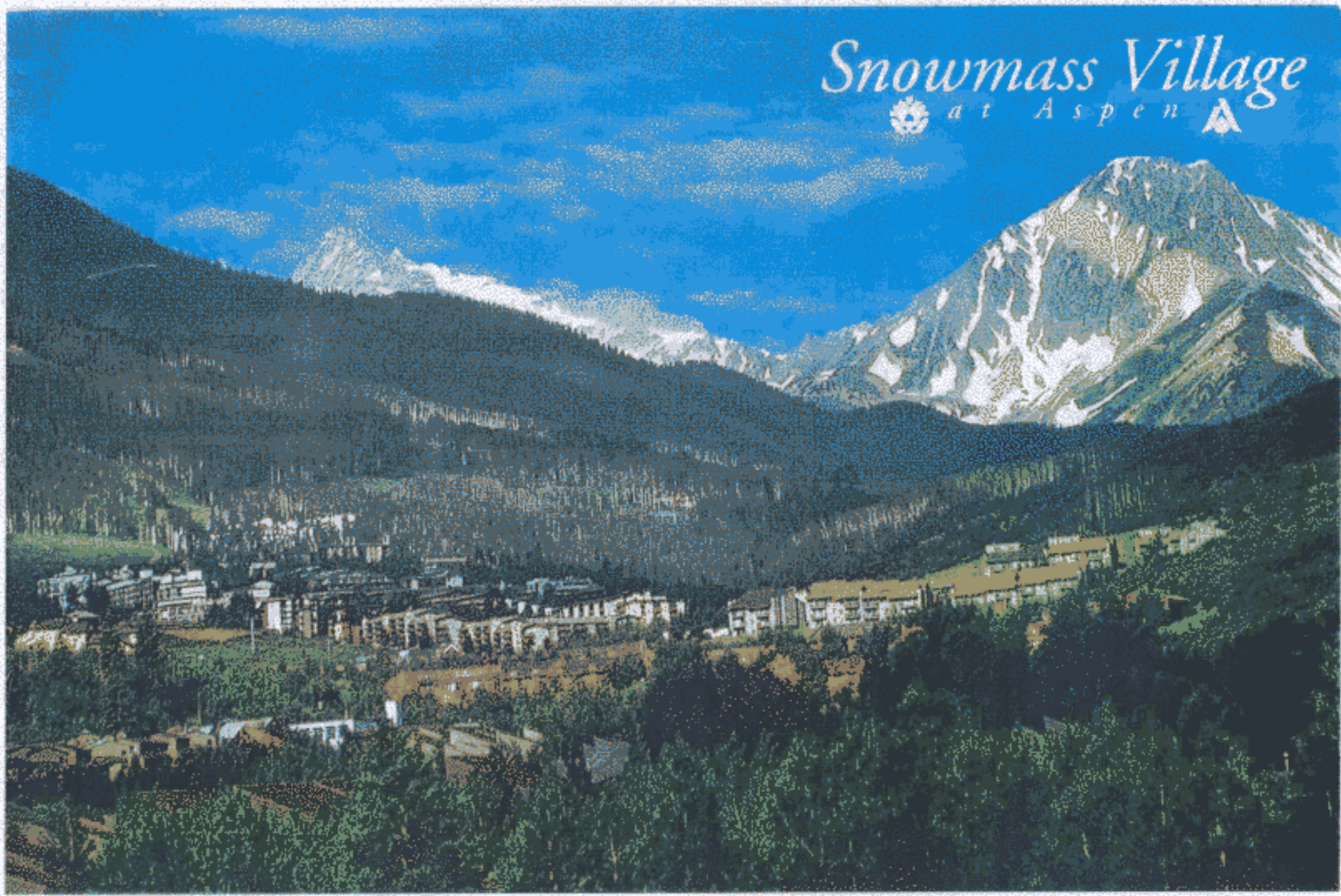


*Snowmass Village*  
at Aspen



# Snowmass 2001 Report to ECFA/DESY Workshop

September 22, 2000 · Hamburg

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- ▷ A community event organized by the Division of Particles and Fields and Division of Physics of Beams of the American Physical Society  
Saturday, June 30 – Saturday, July 21, 2001 in Snowmass, Colorado
- ▷ Ron Davidson (rdavidson@pppl.gov) (DPB) and  
Chris Quigg (quigg@fnal.gov) (DPF) are leading the organization.
- ▷ **Every particle physicist is welcome.** We expect  $O(500)$  participants.
- ▷ The agenda for Snowmass 2001 will be set by the community, not by the laboratories or the funding agencies. We are working constructively with the labs and agencies, and we will call on them for support.
- ▷ We are encouraging very significant international involvement.



# Some Goals of Snowmass 2001

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- ▷ Undertake a thematic survey of our vision of particle physics and its future in the most ambitious intellectual terms. Examine different scenarios for the new physics landscape. Within this broad vision, identify the questions we want to address over the next two decades.
- ▷ Looking far beyond the standard model to string theory and to clues that the coming precision cosmology might supply, understand what might lead us to identify new energy scales or frame new experimental programs.
- ▷ Consider the range of instruments that might help us achieve our scientific goals. Gain a community understanding of readiness, capabilities, cost, and technical risk. Compare U.S. efforts with those in the rest of the world. Describe a comprehensive R&D program to provide the options we will need in the near and far term.
- ▷ Educate and energize our community to create the future we want.
- ▷ Engage with the public, and with other scientists.

# The Shape of Snowmass 2001

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Snowmass 2001 will be devoted to particle physics as a whole

- ▷ Experiments at the highest energies and experiments of exceptional sensitivity; experiments that explore very high scales through virtual effects
- ▷ accelerator experiments and experiments that use natural sources
- ▷ mature subjects and subjects just opening up
- ▷ theory that develops hand-in-hand with experiment and visionary theory that hasn't yet engaged experimental particle physics directly
- ▷ the interplay between particle physics and technology
- ▷ accelerators to address a broad range of scientific opportunities
- ▷ the interaction of particle physics with related fields

At the same time . . .

our whole community needs to engage with the idea of a linear collider

## Some Examples of Accelerator and Technology Topics

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- Instruments or Proto-projects
  - ▷ VLHC / SuperLHC
  - ▷ Linear Colliders: NLC/TESLA/JLC, CLIC, giga-Z
  - ▷ Neutrino Factory
  - ▷ Muon Collider
  - ▷ High-luminosity *B* Factory; *B* Factory Upgrades
  - ▷ Bright proton source
  - ▷  $\tau$ -Charm Factory
  - ▷ Antiproton source / Antimatter Factory
  - ▷ Lepton-Hadron Colliders
- Technology Developments
  - ▷ superferric magnets
  - ▷ superconducting magnets
  - ▷ W-band structures
  - ▷ interplay between particle physics and technology
- Physical Limits to Technology
  - ▷ laser acceleration
  - ▷ quantum / diffraction limits
  - ▷ ultrahigh-field magnets
  - ▷ superconducting RF beyond Nb
  - ▷ expendable nanostructures
  - ▷ new materials
  - ▷ advanced simulation techniques

## Other Particle Physics Events in Summer 2001

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- ▷ 2001 Particle Accelerator Conference, 18 – 22 June 2001, Chicago, Illinois
  - ▷ 4th Edoardo Amaldi Conference on Gravitational Waves (Amaldi 2001) 7 – 12 July 2001, Perth, Australia
  - ▷ International Conference on High Energy Physics of the European Physical Society 12 – 18 July 2001, Budapest, Hungary
  - ▷ 16th International Conference on General Relativity and Gravitation (GR16) 15 – 21 July 2001, Durban, South Africa
  - ▷ 2001 international Conference on Lepton-Photon Interactions 23 – 27 July 2001, Rome
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We could not avoid the overlap with the EPS HEP Conference in Budapest. I have conveyed to the organizers our apologies and our good wishes for the success of the conference.

The core of Snowmass—as usual—will be the work of individuals and working groups on scientific and technical issues . . .

. . . but the times and our situation demand additional special efforts:

▷ *Important involvement of students and young physicists*

- Subsidized housing for 50 students
- Young physicists throughout the organization

▷ Educating ourselves: *teach-ins* on

- How *you* can contribute to accelerator R&D
- Experimental implications of string theory ?
- The role of nonaccelerator experiments in particle physics ?

▷ Education and outreach: “Science Weekend,” July 7/8

▷ A community assessment of where we are, where we want to be, and what it will take to get there



## We will produce three documents for the community

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- ▷ A brief and illustrated thematic survey of what particle physics is and aspires to be, guided by the scientific imperatives.
- ▷ A coherent program of accelerator R&D
  - ▷ highlighting the historical importance of accelerator R&D to our field, and to science and society at large;
  - ▷ making the case for R&D activities not connected with any imminent project.
  - ▷ giving—in very broad terms—the needed work, time scales, and levels of effort required to bring us to the point of deciding about different future instruments;
- ▷ A more detailed, but still  $\lesssim$  100-page “white paper” on the field in all its richness and potential.

## Snowmass 2001 Organizing Committee

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- ▷ A small but thoroughly representative group of people working in the United States who understand (and, in most cases have influenced) what we are trying to accomplish and who have a broad knowledge of the scientific issues and people in the field.
- ▷ Approximately nine persons representing particle physics topics (broadly understood) + seven persons representing various areas of accelerator physics and technology.
- ▷ Their first task will be to create a first list of working groups and convenors. The convenors will balance youth and experience, theory and experiment, U.S. and international.

## US Funding Agencies Planning

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- ▷ Department of Energy and National Science Foundation to jointly sponsor the High Energy Physics Advisory Panel (HEPAP)
- ▷ HEPAP to update 1998 Gilman Subpanel Report this autumn
- ▷ New administration arrives in Washington in January
- ▷ Snowmass 2001
- ▷ HEPAP Subpanel in 2001 to advance toward a plan  
Charge not yet formulated

## How You Can Help

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- ▷ Come to Snowmass!  
First week will have many international leaders
- ▷ Help us create an atmosphere of inclusion and optimism  
—a sense of community  
The shoot-out mentality is our enemy (applies worldwide!)
- ▷ Encourage broad participation in Snowmass 2001  
we welcome younger physicists and advanced students
- ▷ ...