

SLAC-378  
CONF-900799  
UC-414  
(T/E)

PROCEEDINGS  
OF  
SUMMER INSTITUTE ON PARTICLE PHYSICS

*July 16-27, 1990*

GAUGE BOSONS AND HEAVY QUARKS

Program Directors:  
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Sponsored by Stanford University and Stanford Linear Accelerator Center under contract with the U.S. Department of Energy. Contract DE-AC03-76SF00515.

January 1991

Printed in the United States of America. Available from National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161.

## PREFACE

The eighteenth annual SLAC Summer Institute on Particle Physics was held July 16-27, 1990. This year's focus was the study of heavy quark and gauge boson properties based on new data from the CDF experiment at the FNAL  $p\bar{p}$  collider and the ALEPH, OPAL, L3, and DELPHI experiments at LEP. School lectures by David Burke, Bob Cahn, and Daniel Treille reviewed current knowledge of  $W$  and  $Z$  physics at LEP and speculated on what we might learn at future  $Z^0$  factories or high energy linear colliders. Persis Drell and Jim Bjorken commented on the experimental and theoretical situation for  $B$  quarks; Gordon Kane discussed the present understanding of the top quark situation. Steve Errede reported on electroweak studies with hadron colliders. Finally, we had two lecture series on accelerator physics issues: John Rees explored the  $B$ -Factory luminosity frontier, and Ron Ruth explored the linear collider frontier. There were 269 participants from 10 countries at this year's institute. We thank the following colleagues who, as provocateurs, made the afternoon discussion sessions interesting and substantive: Constantine Simopolous, Tim Barklow, Michael Hildreth, Pat Burchat, Chris Hearty, Bob Jacobsen, Yosef Nir, Isard Dunitz, David Muller, Don Fujino, Brian Warr, Adrian Cooper, Dan Schroeder, Eran Yehudai, Tor Raubenheimer, Chris Adolphsen, John Seeman, and Gary Godfrey. The topical conference reviewed frontier research results in theory and experiment, with reports on: the rare  $K$  decay program at BNL; the Tristan program; the  $e^+e^-$  work at DESY, Cornell and LEP; recent data from the UA2 and CDF experiments; CP violation at FNAL and CERN; heavy quark studies with hadron beams; and the neutrino program at CERN. We also reviewed the international astrophysics program. Altogether, it was a stimulating meeting.

We especially thank Nina Adelman-Stolar for taking over this year's Summer Institute while Eileen Brennan was on maternity leave. Eileen came back to help out during the actual meeting, but the planning, preparation and running of this year's meeting was Nina's, and she did it very well!

We also thank Eileen Brennan for her years of running the SLAC Summer Institute and we wish her well in her new role as Holly's mother.

This year, two of the program directors left SLAC; Fred Gilman became Associate Director of Research at the SSC lab in January 1990 and Gary Feldman left for Harvard in September 1990. We wish to thank both of them for their many years of collegial work in running this meeting -15 years for Fred and 11 years for Gary; it made the job enjoyable and was greatly valued and appreciated.

Finally, we welcome Jane Hawthorne, who took on the responsibility of the SLAC Summer Institute in August, and has edited and produced these proceedings.

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