Proposal to Host the Hadron Collider Physics Conference at Duke University

High Energy Physics Group

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Abstract

This is a proposal to host the next Hadron Collider Physics Conference at Duke University. The High Energy Physics group at Duke is actively engaged in research at the CDF experiment at Fermilab and the ATLAS experiment at CERN. Duke faculty members hold leadership positions in these experiments, and pursue a diverse research program. Duke is a private university with a beautiful campus and ample facilities for hosting a conference like HCP. The campus has a large airport in close proximity with good connections to all major cities in the US. Duke has successfully hosted the Physics in Collision conference in 1990.

1 Introduction

The High Energy Physics group proposes to host the next Hadron Collider Physics Conference (after Karlsruhe, October 2002) at Duke University in Durham, North Carolina. We describe below the research activities of the Duke HEP group, the infrastructure available at Duke to be able to host the conference, and the advantageous features of the city of Durham.

2 High Energy Physics Group

The faculty in experimental high energy physics consists of Prof. A. T. Goshaw (James B. Duke Professor), Prof. Seog Oh (Professor), Prof. A. V. Kotwal (Assistant Professor), Prof. M. C. Kruse (Assistant Professor) and Prof. T. J. Phillips (Associate Research Professor). The group also has Drs. Douglas Benjamin, William Robertson and Chiho Wang (Senior Research Scientists), Drs. Susana Cabrera, Christopher Hays and ByeongRok Ko (post-doctoral associates) and six students. The group has a total of 14 physicists, as well as two engineers and several technicians, and a dedicated group secretary who has experience in conference organization.

The research interests of the group are currently focussed on hadron collider physics. We have published in the following areas of research:

- QCD studies of jets multiplicity and jet properties produced in association with W and Z bosons
- Measurement of the top quark production cross section and studies of $t\bar{t}$ events
- Precision measurement of the W boson mass
- Studies of diboson production
- Studies of charm production and decays
- Direct search for the Higgs boson
- Searches for new physics such as quark-lepton compositeness, new gauge bosons and leptoquarks
- Studies of particle production and searches of quark-gluon plasma

We are continuing to pursue this broad research program with Run 2 at the Tevatron. Thus our research interests have a large overlap with the scope of the HCP conference.

In addition to physics analyses we have had a major involvement in detector construction and software development. For the CDF Run 2 detector, these areas include the central open-cell tracker and the silicon detector, and tracking reconstruction software. For the ATLAS detector, we are building a large fraction of the transition radiation tracker (TRT).

The members of the Duke HEP group have held and continue to hold leadership positions in the hadron collider community. Al Goshaw has been serving as co-spokesperson of the CDF experiment for the last five years, and he has served as co-convener of the QCD group. Seog Oh has served as the project manager for the ATLAS TRT detector. Ashutosh Kotwal has served as the co-convener of the electroweak physics group on the DØ experiment and is now serving as the electroweak physics co-convener on the CDF experiment. Mark Kruse has served as the co-convener of the top physics group and is now the co-leader of the top-dilepton group. Doug Benjamin was head of the silicon ladder construction project for CDF run 2a, and is now deputy project manager for the CDF run 2b upgrade project. With this leadership and management experience, we are confident that we will be able to successfully organize this important conference.

3 Facilities at Duke University

Duke University has a faculty containing more than 2000 full-time members, a student body of approximately 6000 undergraduates and 5000 graduates, on a 1800-acre, wooded campus in Durham. The Bryan Student Center, which is opposite the Physics department building, has excellent conference facilities including a state-of-the-art auditorium and several large adjoining meeting rooms. Various dining facilities are also available.

Duke University has very good internet access with high-speed connectivity to all HEP laboratories. Wireless ethernet is available in the Physics department.

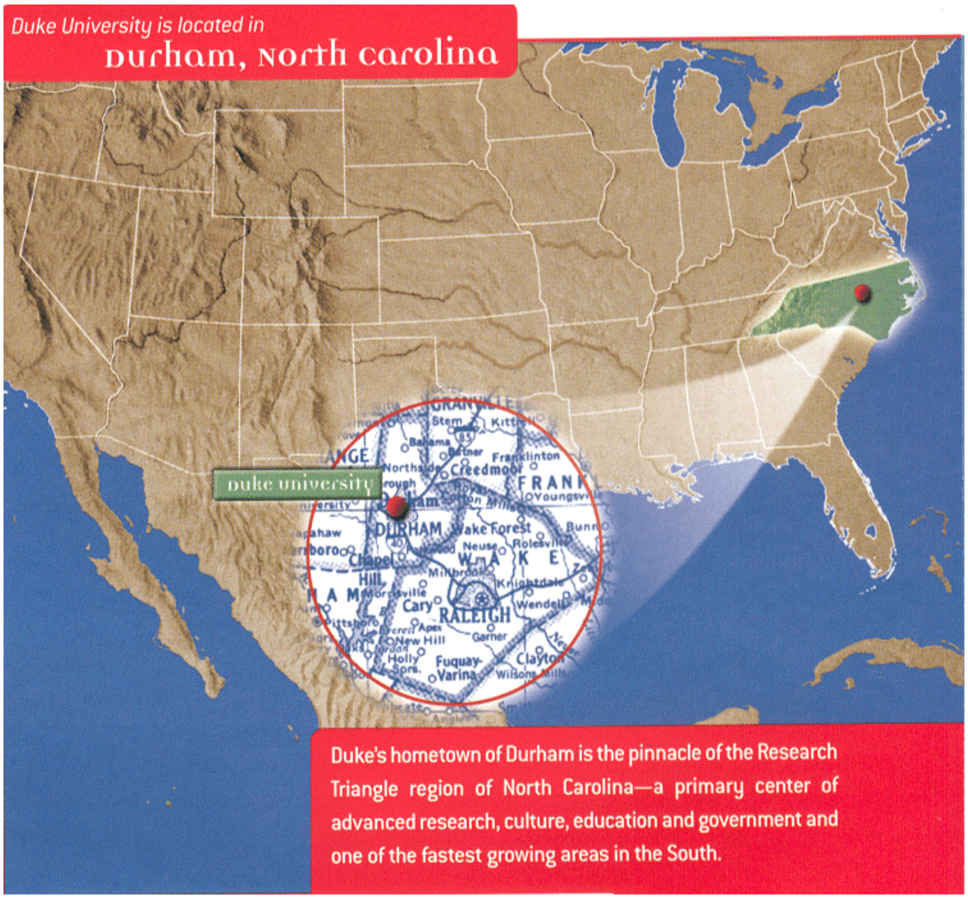
The Washington Duke Inn and the Duke business school both offer excellent hotel accommodations within a 10 minute walking distance from the Physics department. Other hotels are located within a 10-15 minute driving distance.

Duke hosted the Physics in Collision conference in 1990 with about 100 participants, for which Al Goshaw was co-chair and one of the leading organizers. The success of this conference provides the precedent for this proposal. The University Administration also strongly supports this proposal.

4 Durham and Vicinity

The cities of Raleigh (state capital), Durham and Chapel Hill are within a short commute of each other and comprise the Triangle area, which is home to the Research Triangle Park and three large universities: University of North Carolina in Chapel Hill, Duke University and the North Carolina State University in Raleigh. The region is served by the Raleigh-Durham International Airport which is about 25 minute drive from Duke. The airport has excellent connections to all major US cities, with direct flights to, among others, Atlanta, Washington D.C., Boston, Chicago, Cincinnati, Cleveland, Columbus, Dallas, Detroit, Miami, Minneapolis, Newark, New York and Philadelphia. For international participants, there are direct flights to London and Toronto.

In addition to growing businesses and medical facilities in Raleigh and Durham, the Research Triangle Park is home to over 100 companies engaged in technological and pharmaceutical research. The region provides all amenities as well as a wide variety of cultural activities. The region is heavily wooded and quite picturesque and promises an enjoyable experience to the conference participants.



5 Proposed Conference Date

We propose to host this conference in May, 2004. Following the Karlsruhe Conference in October 2002, this would be the right time for the next conference. We expect major new results from the Tevatron Run 2 data from CDF and DØ to be available by the spring of 2004, which would make this an exciting conference.

Duke facilities will be readily available in May, after the end of the spring teaching semester. The weather and flora in Durham and the Duke campus are very pleasant and enjoyable at this time of year.

We acknowledge that the date of this conference needs to be compatible with other scheduled conferences in 2004, such as ICHEP in Beijing. We can be flexible on the date for HCP2004 and will accommodate suggestions from the Conference Steering Committee.

6 Summary

The Duke HEP group proposes to host the Hadron Collider Physics conference at the Duke University campus in Durham, North Carolina in May 2004. We are active in many different areas of hadron collider physics, along with collider detector development.

The Duke campus provides a very attractive site for the conference, both logistically and aesthetically. Our experience in the HEP field and in previously organizing a similar conference (PIC 1990) will help us make HCP2004 a success. We are excited about hosting this conference and hope that our proposal will be received favorably.