Curriculum Vitae

Jaehoon Yu

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Positions

9/01 - Present	Assisstant Professor, Physics Department, UTA
9/98 - 8/01	Associate Scientist, Computing Division, Fermilab
2/96 - 8/98	Research Associate, Particle Physics Division, Fermilab
10/93 - 2/96	Fellow/Instructor, University of Rochester
1/88 - 9/93	Graduate Research Assistant, SUNY Stony Brook, N.Y.
8/87 - 8/88	Graduate Teaching Assistant, SUNY Stony Brook, N.Y.
8/86 - 6/87	Lecturer, College of Nurses, Korea University, Seoul, Korea
8/86 - 6/87	Lecturer, Physics Department, Korea University, Seoul, Korea
8/86 - 6/87	Post Graduate Teaching Assistant, Physics Department, Korea University, Seoul, Korea
3/83 - 2/85	Graduate Teaching Assistant, Physics Department, Korea University,Seoul, Korea

Education

8/93	Ph.D., Physics, State University of New York at Stony Brook Advisor : Professor R.L. McCarthy Thesis Topic : Determination of the Strong Coupling Constant, (α_s) and a Test of Perturbative QCD, Using W+jets Processes in the DØ Detector
12/92	M.A., Physics, SUNY at Stony Brook
2/85	M.A., Physics, Korea University, Seoul, Korea
2/83	B.S., Physics, Korea University, Seoul, Korea

Current research responsibilities

In charge of developing DØ remote analysis systems. Proposed the DØ Regional Analysis Centers to the collaboration. The proposal has been accepted as the collaboration policy. Have been awarded with a Major Research Instrumentation (MRI) grant from National Science Foundation (NSF) for $950,000 to construct a DØ Regional Analysis Center at UTA. A member of DØ Computing Policy Borad and the DØ Offsite Analysis Task Force.

Have proposed and been awarded a DoE Advanced Detector Research grant for $50,000 for research and develpment of Digital Hadron Calorimeter for Linear Colliders. Have been asked to lead the test beam coordination for the detector R& D. In charge of developing simulation packages for Digital Hadron Calorimeter R&D project.

In charge of UTA HEP MC Farm operation and DØ Grid development team. A prototype Grid based MC generation has been successfully demonstrated in July. Have proposed a CSE master's student exchange program for DØ Grid software development at Fermilab. A trial program has begun in the Summer of 2002 and is continuing through this semester. This agreement awarded $20,740 to UTA. This program has a great potential to continue through the next few years. The two CSE students under this program are residing at Fermilab. They will write their theses on the computing project they have been working on.

Services

Graduate Studies Committee Sep. 2001 – present

New Building Committee Sep. 2001 – present

Recruitment Committee Jan. 2002 – present

Teaching

1. Spring & Fall 2002: Have been teaching Undergraduate Classical Mechanics classes for Engineers and Scientists(1443). Supervising undergraduate labs.
2. Summer 2002: Taught a graduate course, "Techniques in High Energy Particle Physics," (5391).
3. Summer 2002 – present: Supervising two master's students, Shahnoor Habib and Venkatesh Kaushik.
4. 2001 – Present: Supervising three CSE master's students of whom two are resident at Fermilab in an exchange program I have established.
5. 2001 – Present: Supervising one CSE undergraduate student.

Conference and Workshop Organization

Organized a series of four DØ Commissioning Workshops, Fermilab, Jan. 2000 – Mar. 2001.

Organized the first DØ RACE workshop on Remote Analysis, Fermilab, February 2002.

Organized a trip of seven UTA students, presenting nine papers, to TSAPS meeting, obtaining partial support for their trip from APS, Oct. 2002.

Grants Awarded

NSF Major Research Instrumentation (MRI) Grant, "Acquisition of High-Performance Computing and Information Storage Inrastructure at UTA," $950,000, Sept. 1, 2002 – Aug. 31, 2005

Fermilab exchange program, "Industrial Practicum Agreement with Fermilab on Student Support," $20,740, Aug. 26, 2002 – Dec. 20, 2002

DOE Advanced Detector Research Grant, "Development of New Hadronic Calorimeter Technology," $50,000, Aug. 15, 2002 – Aug. 14, 2003.

UTA, Research Enhancement Program, "Construction of a Prototype Digital Hadron Calorimeter for High-Energy Physics Experiments," $9,970, August. 1, 2002 – July 21, 2003.

Summary of Experience

Research: Leadership

1. USLC Testbeam program co-coordinator (Sept. 2002 – present)
2. DØ Run II Remote Analysis Systems coordinator (Nov. 2001 – Present)
3. DØ Run II detector commissioning coordinator (Jan. 2000 – Aug. 2001)
4. DØ Run II Online Event Monitoring implementation and coordination (Aug.1998 – Jan. 2000)
5. NuTeV Test Beam Commissioning and operations coordination (Feb. 1996 – Aug. 1998)
6. DØ Run I QCD-WZ Sub-group Convenor (Oct. 1993 – Jan. 1996)

Research: Hardware

1. DØ central calorimeter (CC) construction, debugging, assembly, and commissioning.
2. DØ test beam calorimeter debugging and High Voltage set up.
3. DØ CC temperature monitoring and cool down.
4. DØ calorimeter system High Voltage set up, monitoring, and maintenance.
5. DØ detector commissioning.
6. Acted as a detector leader for DØ data taking (Run Ia and Ib).
7. Proposed a forward preshower detector for DØ upgrade program.
8. NuTeV main neutrino beamline construction, alignment, maintenance, and commissioning.
9. NuTeV calibration beam particle ID system and the spectrometer set up.
10. NuTeV calibration beamline set up, beam tuning, commissioning, and run coordination.
11. Acted as a shift-captain and frequently a liaison officer of the NuTeV experiment to the laboratory during the data taking.

Research: Software

1. Wrote a pc program to check calorimeter readout channel continuity.
2. Wrote a program for DØ central calorimeter temperature monitoring.
3. Wrote an Ntuple package to monitor the entire DØ calorimeter high voltage system.

4. Wrote the first version of DØ express-line luminosity calculation program.
5. Wrote the first version of Ntuple package program for DØ data analyses.
6. Wrote the first version of DØ spurious jet removal program.
7. Implemented a proto-type version of the DØ upgrade forward preshower detector geometry into the DØ upgrade Geant package.
8. Completed and maintained NuTeV online monitoring program.
9. Wrote various correction routines for NuTeV data analyses.
10. Set up NuTeV calibration database.
11. Designed, implemented, and commissioned the DØ Run-II online event monitoring system.

Research: Physics

1. Completed an analysis concerning a measurement of the strong coupling constant, using W+1jet to W+0jet cross section ratio.
2. Wrote a phenomenology paper concerning measurement of the strong coupling constant using QCD multi jet events cross sections.
3. Wrote a phenomenology paper concerning corrections to W+1jet to W+0jet ratio measurements, using a Pade approximant.
4. Proposed QCD studies using W/Z + jets events and convened the group in DØ.
5. Actively participated in NuTeV $\sin^2\theta_W$ measurement.
6. Completed a DØ Z+jets QCD analysis with a graduate student and a colleague.
7. Proposed a precision $\sin^2\theta_W$ measurement in future muon collider neutrino beam and writing a section concerning this measurement in the proposed paper.
8. Completed a inverse muon decay cross section measurement and set the most stringent limit on the leptopn flavor number violation process in the neutrino-nucleon interaction.
9. Participating in Higgs particle search at the Tevatron

$sin^2\theta_W$ and Inverse Muon Decay Measurements

As I joined the NuTeV (FNAL-E815) experiment, a neutrino-nucleon deep inelastic scattering experiment, I realized that the two most important measurements in this experiment are the measurement of weak mixing angle, $sin^2\theta_W$, and the measurement of nucleon structure functions. Measurement of $sin^2\theta_W$ from the previous experiment, CCFR, suffered significantly from two major sources of systematic uncertainties : 1) theoretical calculation and incorporation of charged current charm production cross section and 2) the contamination of ν_e in the beam, resulting from K_L decays.

In order to reduce these significant systematic uncertainties, one needs to have a technique that is insensitive to sea quark distributions, and to reduce the number of ν_e from K_L decays. A quantity proposed by Paschos and Wolfenstein, the ratio of difference of neutral-current(NC) and charged-current(CC) cross sections, $R^- = (\sigma^{\nu,NC} - \sigma^{\overline{\nu},NC})/(\sigma^{\nu,CC} - \sigma^{\overline{\nu},CC})$ is insensitive to sea quark distributions.

However, measuring this quantity requires separate measurements of the neutral current cross sections induced from neutrino (ν) from that of anti-neutrinos ($\overline{\nu}$). Separating beam into ν and $\overline{\nu}$ is the only method to make this measurement feasible. The NuTeV experiment built such a beamline called Sign-Selected-Quadrupole-Train, SSQT, and finished taking data in September 1997, accumulating a total of $\sim 3\times 10^{18}$ protons on target.

I have actively participated in $\sin^2\theta_W$ analysis from the beginning, acting as a co-leader of the group, reducing significant experimental systematic uncertainties. Currently, the group has put out a preliminary result from this analysis with a resulting value of $sin^2\theta_W^{On-Shell} = 0.2253 \pm 0.0021$. This measurement can be used to evaluate the mass of the W boson in “on-shell” renormalization scheme, in the context of the standard model, using the “On-Shell” relationship: $sin^2\theta_W = 1 - (M_W/M_Z)^2$. The resulting value of the standard-model “on-shell” W mass is $M_W = 80.26 \pm 0.11$(GeV) which is comparable to those from direct measurements of hadron collider experiments. A thesis student is working on finalizing this analysis.

Since $sin^2\theta_W$ analysis is being finalized, I turned my attention to other measurements that can be done in this experiment. The project that I am currently working on is the cross section measurement of the inverse muon decay process ($\nu_\mu + e^- \rightarrow \mu^- + \nu_e$). This process provides a clean test of electroweak sector of the standard model. Since the NuTeV beamline ran with ν and $\overline{\nu}$ separately, this measurement can be carried out with smaller systematic uncertainties compared to previous measurement from the CCFR.

QCD measurements using $W + Jets$ Process

My thesis analysis in the DØ experiment was on a determination of the strong coupling constant, α_s, using the cross section ratio ($\mathcal{R}_{\infty\prime}$) of $W + 1jet$ to $W + 0jet$ processes. Since in leading order, $W + 1jet$ process has one each of electroweak and strong vertex whereas $W + 0jets$ process has only an electroweak vertices, the ratio of the cross sections of these two processes is proportional to the strong coupling constant. Since in 1992 a next-to-leading order (NLO) calculations of these two processes became available, I carried out the analysis using the NLO calculations. While I was carrying out the analysis, it became clear that the predicted ratio in NLO is very insensitive to the value of α_s unlike it has been observed from the same type of analysis carried out in the UA2 experiment. Carrying out the analysis to this point required interaction with all three parton distribution function groups (CTEQ, MRS, and GRV) to do the analysis in a consistent manner. I have persuaded all three groups to re-fit the existing structure function data for various values of α_s to be used in NLO calculations. The three groups had published these analyses and I wrote a paper on this study published in PRL, on behalf of the DØ experiment.

After graduation, I became aware of rich physics possibilities using $W/Z+jets$ final states. Since at that time the total number of expected W and Z boson events from the Fermilab collider experiment reach to $100,000$ and $10,000$ in electron final states, respectively, by the end of Run Ib, I proposed a QCD analysis subgroup, utilizing the vast amount of W and Z bosons produced with jets, and headed the group until I left DØ to join the NuTeV experiment. The group generated vast interest amongst many theorists and is continuing the analyses for better understanding of QCD.

Work on Phenomenology

Due to an extensive discussion with a few phenomenologists concerning the $\mathcal{R}_{10}$ measurement, I have worked together closely with Walter Giele and Nigel Glover who are the authors of the NLO calculation Monte Carlo program (DYRAD). We realized that using inclusive jet cross sections to determine α_s is feasible in hadron collider experiments. We wrote this idea onto a paper and published in PRD.

After the experimental measurement of $\mathcal{R}_{10}$ had been published in PRL, I was suggested by another theorist, M. Samuel from Oklahoma State University, to write another paper on the measurement. This study was to see if uncomputed higher order contributions to $\mathcal{R}_{10}$ could explain the discrepancy ($\sim 1.5\sigma$) between data and NLO predictions, using a technique called Padé approximants. This study was published on PLB, concluding that the higher order contribution alone is not enough to resolve the discrepancy.

Hardware Experience: Detector Systems

I participated in construction of the DØ central calorimeter system as a graduate student. Specifically, I worked on construction of the calorimeter modules which were built at BNL in 1988. I then worked on assembly of the DØ central calorimeter, participating in various areas of the assembly: debugging of the modules, quality control and installation of cryostat components, design of various parts of the calorimeter system, etc. This participation involved leading groups of technicians, contractors, physicists. In debugging process, I wrote a pc program that measured the capacitance of all the calorimeter readout channels, verifying the integrity and electrical continuity of the calorimeter readout system.

I accomplished given tasks successfully, often ahead of schedule. I had almost single handedly debugged the calorimeter modules and set up the high voltage systems for the calibration projects of the central calorimeter system, while participating in preparation and cosmic-ray commissioning of the main central detector systems. I set up the high voltage system of both the central and end calorimeters, effectively leading the project.

I also had adopted the Ntuple, a CERN analysis package, into calorimeter high voltage monitoring and provided a program for the analysis of the current readback. It is at this time that I also took upon a project to write a program to monitor and to display temperature of the DØ central and end calorimeters during the cool down and the run. In addition, I was involved briefly in a scintillating fiber tracker R&D program which was a part of the DØ Run-II upgrade project, together with a few graduate students involved in the project.

I modified the NuTeV calibration particle ID system, especially the Cerenkov counter, to an automatically controlled differential counter. I also have modified one of the calibration spectrometer magnets to an automatically controlled rotating magnet to change the incident direction of the calibration beam to the detector.

All these years of hardware experience provide solid foundation for carrying out my current responsibility of commissioning the Run II DØ detector. Even if the detector system is more complicated than the NuTeV test beam experiment, the fundamental underlying structure of the detectors is the same. Therefore, the basic experience I had with the Run I DØ detector together with the experience at the NuTeV experiment naturally provide firm foundation.

Hardware Experience: Accelerator and Beamline

Shortly after I joined the NuTeV experiment, I participated in the construction of the new beamline of the experiment, the Sign-Selected-Quadrupole-Train (SSQT). Most the work I put in this project was making sure all the construction progresses as planed, establishing good communication and coordination between all the parties involved in the construction process. I then took in charge of the final setup of the beamline, including polarity checking of all the magnets in the beamline.

As soon as the SSQT started receiving protons on target in May of 1996, I took in charge of setting up another beamline (NT) used for NuTeV detector calibration. Since practically no one involved in the calibration effort resided at Fermilab, I had to set up the beamline almost single handedly, making necessary modifications of various beamline elements. This effort required coordinating almost all the divisions in Fermilab. Putting in a lot of effort, I was able to bring up the beamline by August, 1996, in its muon mode, making this beamline (NT) the third to be operating in 1996-97 Fermilab Fixed Target run, well ahead of any other fixed target experiments. This beamline was allowed to run with all other particle modes (hadrons and electrons) by early October of 1996.

The next task involving beam was commissioning the beamline, establishing all the necessary calibration tunes in various modes for many different energies. I led a team of three physicists to establish all the tunes. This task required many days and nights of taking extra shifts, in addition to the regular neutrino data taking shifts.

Run Coordination and Leadership

I have initiated and led a physics analysis subgroup in the DØ experiment that pursues QCD using $W/Z + jets$ final states. This group had a few thesis graduate students, some of whom have already graduated.

I also led the DØ upgrade forward preshower detector proposal together with professor Kaushik De of University of Texas at Arlington. The proposal had been accepted by the collaboration.

In NuTeV, as the person in charge of setting up the NuTeV test beamline, I naturally took over the coordination of the calibration data taking. Since the calibration is important to improve systematic uncertainties, especially in structure function analysis, it was necessary for me to keep in mind what type of runs had to be taken to achieve the physics goals. In addition, I needed to coordinate with the Beams division to maximize the beam usage for various type of calibration data taking.

Due to the nature of small fixed target experiment, at NuTeV I had to act as a senior physicist and as a shift-captain-in-charge, making on-the-fly decisions.

As the run ended, I took in charge of leading the NuTeV calibration effort whose goal is to determine the energy scale to the precision of 0.3%. In order to accomplish the goal, I organized a NuTeV calibration workshop in December of 1997 which had more than 2/3 of collaborators participated. Calorimeter calibration analyses had been completed and I led the collaborational effort to publish the result. The result has been published in NIM **A447**, 377, 2000.

Joining back to the DØexperiment, I took upon the online event monitoring project and started leading the group for the preparation of Fermilab collider Run II. Even if the online monitoring is one of the most crucial items for an experiment to proceed, there was no one carrying out this project. As I took upon the project, I started recruiting man power in various areas of the project and at the same time I initiate laying down requirements for various parts of the project. The requirement documents are important in order to design software in a coherent manner.

I have been appointed to lead the Run II DØ detector commissioning, in January of 2000. Since then I have been working as the leader to prepare the detector, as much as we can, for the beam, despite the delay of many detector components. I have been setting small milestone goals to focus our effort in preparing the read out portions. I have organized many workshops to concentrate experts in one place to accomplish milestone goals. Two of the achievement we had in the milestone workshops are establishing the bases of the detector commissioning and setting up the silicon detector facility's 10% test stand. I have also been suggesting and implementing many means that help expediting the detector commissioning efforts.

Experience on Software and Analysis Algorithms

Aside the DØ calorimeter hardware monitoring and measurement programs I discussed in the previous section, I have worked on developing analysis tools and algorithms in DØ experiment. I have adopted Ntuples early on and written my analysis programs using the Ntuple package. (Using this analysis program, I was able to find the first two-jet events from $p\overline{p}$ interactions in DØ experiment.)

At that time I realized that people have hard time understanding the DØ data structure written in ZEBRA, so I proposed and wrote a global analysis package using the Ntuple for the DØ QCD analysis group. I also have developed an algorithm that removes spurious jets due to detector noise or accelerator background, based on my knowledge on the DØ calorimeter system. This algorithm is still used in the DØ analyses involving jets or missing transverse energy in the final state. I then implemented the NLO $W+jets$ cross section calculation Monte Carlo, DYRAD, into various DØ QCD analyses using $W/Z+jets$ final states. I was also involved in the DØ upgrade forward preshower detector proposal and set up a geometry of the detector system, using GEANT.

In NuTeV experiment, I completed the online monitoring software which was written in fortran and C, interfaced with TCL and Tk. I maintained the program throughout the run. During the course of the run, I wrote many routines that are used in offline analyses of neutrino and calibration data.

As the NuTeV data taking came closer to the end, I, as the person in charge of the calibration run coordination, realized that it is necessary to organize the vast amount of the calibration beam data in an orderly fashion for systematic and timely analyses. For this purpose, I developed a Web based database system with a graduate student. This database system provided crucial information for data reduction and split, as well as offline calibration analyses.

Since I have re-joined the DØ experiment in 1998, I have been in charge of DØ Run-II online monitoring system. This project requires extensive knowledge on C++ and other scripting languages at the frontier of current computer software. I have established a proto-type online monitoring system, that reads data from a Monte Carlo file and browses histograms, within 3 months of taking up the project. This proto-type has been commissioned and been used currently for various detector commissioning effort. In the process of establishing the monitoring system, I proposed a design of an interactive-offline/ online framework which enables users for asynchronous and multi-threaded data processing.

Proposals for Physics Analyses and a Detector

I proposed and started a whole new regime of improving the understanding of QCD, using $W/Z + jets$ final states, in DØ experiment. Both the DØ and CDF experiments now have groups of people working on various QCD subjects, using these final states.

I proposed the DØ upgrade forward preshower detector together with professor Kaushik De in University of Texas at Arlington. The preshower detector is a crucial element to distinguish π^0 from γ in order for the DØ experiment to maximally utilize the hermeticity of the calorimeter for forward direct photon cross section measurements at low x. This region of kinematics is important in determining gluon distribution function which currently is not well measured. The detectors have been built by the BNL group and been mounted in their final resting place, awaiting to be commissioned.

I participated in a muon collider workshop which was held in November, 1997, at Fermilab. The purpose of this workshop was to identify distinctive physics capabilities in the future muon collider facility. In the workshop, I was interested in utilizing very intensive neutrino beam expected from the constant decay of muons revolving around the collider ring. People had given up measuring $sin^2\theta_W$ in this neutrino beam, due to the high concentration of ν_e, keeping in their mind a classical heavy nuclear target detector. However, I noticed that due to high intensity one could imagine using a light target (H_2 or D_2) followed by a generic detector system that can identify muons and electrons resulting from their charged current (CC) interactions. I went ahead and estimated the error on $sin^2\theta_W$ in such a system based on CCFR and NuTeV uncertainties. The uncertainty from this initial estimate was δM_W equivalence of 30MeV which is comparable to TeV33 expectation from a traditional M_T fit. This study was well accepted in the workshop and the precision measurement of $sin^2\theta_W$ is taken as one of the strong points of the future muon collider facility. I have been continuously involved in muon collider/neutrino factory facility studies, participating in as many workshops as possible, to keep myself informed and educated. I also have participated in producing a draft paper on neutrino factory physics potential and in producing a report to the Fermilab directorate for physics potential at such a facility.

Teaching Experience

While I was in Korea, I was an adjunct professor (lecturer) for two colleges, teaching undergraduate students in two drastically different fields. I taught not only elementary physics but also a semester of mathematics. I also set up, graded lab reports, and issued tests to my students as a graduate or a post graduate teaching assistant.

My lecture experience in the US began from the very first semester of my American graduate school era, as a graduate teaching assistant. I not only prepared physics labs for undergraduate students but also gave them lectures to describe and to provide them directions on the lab sessions.

As I was working for the University of Rochester on the DØ experiment, I was naturally working very closely with five Rochester graduate students, guiding and directing them to the right directions in their research. In addition to Rochester graduate students, I supervised a few thesis students in the QCD subgroup I was convening. Both these tasks gave me chances to work closely with graduate students and to guide them through their research.

The calibration and physics analysis groups in the NuTeV experiment also have a few graduate student working on various projects. I, as the leader of calibration group and as a co-leader of the Neutral Current analysis group, constantly interact with the students to achieve the common goals.

I supervised a high school teacher and two undergraduate students during the summer of 1997, and a teacher and one undergraduate student in the summer of 1998. These five summer employees worked on calibration projects and produced seven reports on their projects under my close supervision. In addition, I have supervised two students of my colleagues during both summer.

I have hired a high school student and two teachers in the summer of 1999 for an out-reach program, DØ QuarkNet. These three summer employees produced a draft Web site to be used in high school class rooms. The high school student worked for me part-time throughout the semester to continue improving the QuarkNet page. I have hired another high school student in the summer 2000 for various web based interface developments and continue improving the QuarkNet page. This student produced, under my supervision, the DØ physicist shifter registration web interface.

Jaehoon Yu

Out Reach Program

I think one of the most important functions of any research field is to inform its results to as wider audience as possible. In this spirit, I have been thinking about introducing High Energy Physics as early on in school education as possible. In early 1999, I noticed that there is a program spearheaded by professor R. Ruchti of Notre Dame, the QuarkNet. This program shares the basic principle as I had in my mind, I proposed a program and been selected as a QuarkNet site. When I was told by the QuarkNet office that I would be getting one lead teacher instead of two originally intended, due to the fact that one must be given to CDF, I went ahead and obtained some more fund to add two more people to the project. This team of three people with another volunteer student generated a draft web page for high school class room use.

I then planned and organized the second year program of the Fermi QuarkNet site (by now it is the Fermilab site because the CDF teacher did not return) in the summer 2000. I am intending to deploy a cosmic-ray angular distribution measurement set up to a high school in the area near by the lab and to develop viable one to two semester high school senior project or curriculum, using this expermental set up. We have enough budget to establish a few of these set up to deploy more schools. I, Rob Roser from CDF experiment at Fermilab, and the team (now with 7 additional teachers) are planning to submit fund proposal to the State of Illinois or to the Federal government to continue the development throughout the next 7-10 years. We have had another summer instutite this past June in preparation for the proposal submission. I also have given a lecture at the Snowmass 2001 high energy physics studies conference and participated actively in the science weekend to interact with general public.

<u>*Jaehoon Yu*</u>

Minority Activity

As an ethnic South Korean, I think it is important to keep the culture of the origin, because knowing one's root is extremely important to keep one's identity. Therefore, I was the vice president of the Mid-West chapter of the Korean-American Engineers and Scientists Association (KSEA-MW). This organization offers many activities to promote Korean culture and cohesiveness of ethnic Korean Scientists and Engineers in the Chicago area. As one of the activities, it offers scholarship to 5-6 high school seniors whose intended major is science or engineering. As the vice president, I had organized and hosted a KSEA-MW Harvest Moon day picnic at Fermilab. I also acted as the chairman of the selection committee and just completed selecting this years scholarship winners. I plan to continue involved in promoting ethnic Korean culture in scientific and engineering fields.

Conferences

1. XXXth SLAC Summer Institute, SLAC, Menlo Park, CA (2002)
2. Snowmass2001, Snowmass Village, Colorado (2001)
3. ICHEP2000, Osaka, Japan (2000)
4. The 4th Recontres du Vietnam, Hanoi, Vietnam (2000)
5. ICHEP98, Vancouver, Canada (1998)
6. Fermilab Annual User's Meeting, Fermilab (1998)
7. Workshop on DIS '98, Brussels, Belgium (1998)
8. The 33rd Recontres de Moriond (QCD), Les Arc, France (1998)
9. The European High Energy Physics Conference '97, Jerusalem, Israel (1997)
10. The 32nd Recontres de Moriond (QCD), Les Arc, France (1997)
11. The 10th Topical Workshop on $p\overline{p}$ Collider Physics Fermilab, IL (1995)
12. The 30th Recontres de Moriond (QCD), Les Arc, France (1995)
13. 22nd INS workshop on Physics with High Energy Colliders, Tokyo, Japan (1994)
14. DPF '92, Fermilab, Batavia, IL, November (1992)

Contributed Talks

1. "Digital Hadron Calorimeter Using GEM," Invited Talk at 2002 International Workshop on Linear Collider, Jeju, South Korea (2002)
2. "Precision Measurement of $sin^2\theta_W$ at NuTeV," Invited Lecture at 2002 SLAC Summer Institute, SLAC, Menlo Park, CA (2002)
3. "DØ RACE Status Report," Plenary talk at 0 Workshop, Oklahoma University, OK (2002)
4. "Summary of the DØ Regional Analysis Center Working Group," Plenary talk at the DØ RACE Workshop, Fermilab, Batavia, IL (2002)
5. "Proposal for DØ Remote Analysis Model (DØ)," Plenary talk at the DØ RACE Workshop, Fermilab, Batavia, IL (2002)
6. "Measurement of Lepton Flavor Number Violation at a High Intensity Future Neutrino Facility," Presented at the Snowmass 2001 Studies, Snowmass Village, Colorado (2001)

7. "Recent Electroweak Results from NuTeV Experiment at Fermilab," Presented at ICHEP2000, Osaka, Japan (2000)

8. "Physics Potential and the Status of DØ Upgrade at Fermilab," Presented at ICHEP2000, Osaka, Japan (2000)

9. "Recent Electroweak Results from NuTeV Experiment at Fermilab," Presented at the 4th Recontres du Vietnam, Hanoi, Vietnam (2000)

10. "Determination of α_s and Measurements of R_L, κ, and $\mid V_{cs} \mid$ from $\nu - N$ DIS at CCFR," Presented at the 29th ICHEP, Vancouver, Canada (1998)

11. "Recent Electroweak Results from Tevatron Experiments," Plenary talk given at the Fermilab Annual Users Meeting, Fermilab (1998)

12. "DIS Prospects at the Future Muon Collider Complex," presented at DIS98, Brussels, Belgium (1998)

13. "Precision Measurements of $sin^2\theta_W$ from $\nu - N$ Scattering at NuTeV and Direct Measurements of M_W," presented at DIS98, Brussels, Belgium (1998)

14. "Recent QCD Results in $\nu - N$ Deep Inelastic Scattering," presented at DIS98, Brussels, Belgium (1998)

15. "Strange Sea and α_s Measurements in $\nu - N$ Deep Inelastic Scattering," presented at the 33rd Recontres de Moriond, Les Arc, France (1998)

16. "Precision Measurement of Electroweak Parameters in $\nu - N$ Scattering," presented at EPS97, Jerusalem, Israel (1997)

17. "Measurement of α_s from $\nu - N$ Deep Inelastic Scattering at CCFR," presented at the 32nd Recontres de Moriond, Les Arc, France (1997)

18. "W/Z+jets production at the Tevatron," presented at the 10th Topical Workshop on $p\overline{p}$ Collider Physics Fermilab, IL (1995)

19. "W/Z+jets production at the Tevatron $\overline{p}p$ collider," presented at the 30th Recontres de Moriond, Les Arc, France (1995)

20. "QCD at the Tevatron $\overline{p}p$ Collider at $\sqrt{s} = 1.8$TeV," Plenary talk given at the 22nd INS Symposium, Tokyo, Japan (1994)

21. "Production of jets in association with W vector bosons in the DØ detector," presented at the Division of Particle and Fields of the American Physical Society, Fermilab, Batavia, IL, November (1992)

Workshops

1. International Workshop on Linear Colliders, JeJu, South Korea (2002)
2. US Linear Collider Workshop, Santa Cruz, CA (2002)
3. DØ RACE Workshop, Fermilab, Batavia, IL(2002)
4. Workshop on GriPhyn and iVDGL, Ganesville, FL (2002)
5. DØ Workshop, Oklahoma University, OK (2002)
6. DØ Workshop, Northern Illinois University, June (2000)
7. Workshop on Physics Potential at a Neutrino Factory, Monterey, CA, May 19-25 (2000)
8. Two-day workshop on Neutrino Factory Feasibility Study, Fermilab, Feb. (2000)
9. Physics Potential & Development of $\mu^+\mu^-$ Colliders, Fairmont Hotel, San Francisco, CA, Sec. 15-17 (1999)
10. DØ Online workshop, Fermilab, June (1999)
11. Workshop on the Potential for Neutrino Physics at Future Muon Colliders, BNL, New York, August 13-14 (1998)
12. Workshop on Physics at the First Muon Collider, Fermilab (1997)
13. Workshop on Physics at NuMI, Fermilab (1997)
14. Workshop on "Physics Confronting QCD with Experiment," Fermilab (1996)
15. 2nd Workshop on QCD at 2TeV, Michigan State University, MI(1995)
16. DØ QCD workshop at the University of Arizona, Tucson, AZ (1995)
17. DØ workshop at the Northwestern University, Evanstone, IL (1994)
18. Workshop on QCD at 2TeV, Michigan State University, East Lansing, MI (1993)
19. DØ workshop at SUNY at Stony Brook, Stony Brook, NY (1993)
20. DØ QCD workshop at the University of Arizona, Tucson, AZ (1992)
21. The 7th Topical Workshop on $p\overline{p}$ Collider Physics, Fermilab, IL (1988)

International and Domestic Invited Seminars

1. "Status of DØ and Its Data Grid," Invited seminar at Seoul National University, Korea, Aug. 2002
2. "Status of DØ and Its Data Grid," Invited seminar at Korea University, Korea, Aug. 2002
3. "Status of DØ and Its Data Grid," Invited seminar at YeonSei University, Korea, Aug. 2002
4. "Status of DØ and Its Data Grid," Invited seminar at SungKyunKwan University, Korea, Aug. 2002
5. "Status of DØ and Its Data Grid," Invited seminar at GyeongSang National University, Korea, Aug. 2002
6. "Status of DØ and Its Data Grid," Invited seminar at KyungPook National University, Korea, Aug. 2002
7. "Practical Implementation of Grid: DØ Data Grid," Invited seminar at Rice University, May 2002
8. "Muon Collider, Neutrino Factories, and Proton Drivers," Invited seminar at The University of Michigan, (2001)
9. "Physics Potential of the DØ Upgrade and TeVatron," KyungPook National University, Tae-Gu, Korea (2000)
10. "Physics Potential of the DØ Upgrade and TeVatron," SungKyunKwan University, SuWon, Korea (2000)
11. "Physics Potential of the DØ Upgrade and TeVatron," Korea University, Seoul, Korea (2000)
12. "Physics Potential of the DØ Upgrade and TeVatron," YeonSei University, Seoul, Korea (2000)
13. "Precision Measurement of $sin^2\theta_W$ at $\nu - N$ Scattering; Past, Present, and Future," KyungSang National University, Jin-Ju, Korea (1999)
14. "Precision Measurement of $sin^2\theta_W$ at $\nu - N$ Scattering; Past, Present, and Future," KyungPook National University, Tae-Gu, Korea (1999)
15. "Precision Measurement of $sin^2\theta_W$ at $\nu - N$ Scattering; Past, Present, and Future," Korea University, Seoul, Korea (1999)

16. "Precision Measurement of $sin^2\theta_W$ at $\nu - N$ Scattering; Past, Present, and Future," Seoul National University, Seoul, Korea (1999)
17. "Precision Measurement of $sin^2\theta_W$ at $\nu - N$ Scattering; Past, Present, and Future," HanYang University, Seoul, Korea (1999)
18. "$\nu - N$ DIS QCD and EW Results," NIKHEF, Amsterdam, Netherlands (1998)
19. "$\nu - N$ DIS QCD and EW Results," University of Geneva, Switzerland (1998)
20. "QCD results from $\nu - N$ DIS," DESY, Hamburg, Germany (1997)
21. "QCD results from $\nu - N$ DIS," University of Durham, UK (1997)
22. "QCD results from $\nu - N$ DIS," SACLAY, France (1997)
23. "DØ QCD results," CERN PPE seminar, Switzerland (1995)
24. "DØ QCD results," Saclay, France (1995)
25. "DØ QCD results," University of Durham, UK (1995)
26. "DØ QCD results," Kun-Kuk University, Seoul, Korea (1994)
27. "DØ QCD results," Korea University, Seoul, Korea (1994)
28. "DØ QCD results," Seoul National University, Seoul, Korea (1994)

Schools

1. The 1994 NATO Advanced High-Energy physics summer school.
2. The 1992 CTEQ Summer School : "QCD Analysis and Phenomenology".
3. The 1990 SLAC Summer Institute: "Gauge Bosons and Heavy Quarks".

References

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S. Avvakumov et al., NuTeV Collaboration, Phys.Rev.Lett.89:011804,2002

G. P. Zeller et al., NuTeV Collaboration, Phys.Rev.Lett.88:091802,2002

"Multiple jet production at low transverse energies in $p\bar{p}$ collisions at $\sqrt{s} = 1.8$ TeV", V. M. Abazov , submitted to Phys. Rev. D; FERMILAB-Pub-02/153-E, hep-ex/0207046.

"$t\bar{t}$ production cross section in $p\bar{p}$ collisions at $\sqrt{s} = 1.8$ TeV", V. M. Abazov , accepted for publication in Phys. Rev. D; hep-ex/0205019.

"High-p_T Jets in $p\bar{p}$ Collisions at $\sqrt{s} = 630$ and 1800 GeV", B. Abbott , Phys. Rev. D **64**, 032003 (2001); FERMILAB-Pub-00/216-E, hep-ex/0012046.

"Search for mSUGRA in single electron events with jets and large missing transverse energy in $p\bar{p}$ collisions at $\sqrt{s} = 1.8$ TeV, V. M. Abazov , submitted to Phys. Rev. D; FERMILAB-Pub-02/074-E, hep-ex/0205002.

"Improved W boson mass measurement with the DØ detector", V. M. Abazov , Phys. Rev. D **66**, 012001 (2002); FERMILAB-Pub-02/055-E, hep-ex/0204014.

"A direct measurement of the W boson width", V. M. Abazov , Phys. Rev. D **66**, 032008 (2002); FERMILAB-Pub-02/063-E, hep-ex/0204009.

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