90-92

I started working at LBL in the summer of 1990 on the WALIC (Warm Liquid Calorimeter) project for SDC. My worked involved the responsibility of test beam activities at FNAL and montecarlo studies of compensation of iron/TMP and lead/TMP sampling calorimeters for SDC.

92-93

• Since the beginning '92 I am collaborating with the SDC-LBL-Calorimeter Group (Co-leaders R.Kadel, M.Pripstein). After participating to the preparation for the test at Brookhaven of a 16-tower ECEM prototype last summer (my responsibility was the DAQ) I took care of preparing the software for the analysis of the test beam data. Eventually this software was taken over and implemented with new algorithms for track reconstruction by a graduate student who is working with our group since beginning '93 and who I had to partially supervise.

• Towards the end of '92 and the first few months of '93 I was pretty much fully involved in the preparation for the cosmic ray test at LBL of the same prototype that was tested in the summer '92 at Brookhaven. My responsibility was to set up the electronics (trigger and read-out) and the DAQ.

• Since a few months I have also been concentrating on the preparation for the new ECEM prototype test to be performed at the Cern SPS/PS in the fall '93.
My responsibility is to provide a new DAQ System based on UNIX platform and using VME/CAMAC. I am also working on the set up of the electronics related to the trigger and read-out. I will be going to Cern to install the complete electronics-DAQ system and I will be staying there for the duration of the test.

• I am also part of the Portable DAQ group (G.Abrams, P.LeDu and myself).
Last year we submitted a proposal to the LDRD (is indicated in the list of funded proposal)
and we obtained funding for FY 93. This year we submitted a proposal. again (continuation) as we would like to continue to pursue the project of a Portable DAQ with new tools (especially in the area of the GUI).

• Last fall, I concluded my work for WALIC by finishing up the analysis of the last FNAL test beam data. This produced the papers that are indicated in the list of this report.

93-94

• I have been collaborating with the LBL-Calorimeter Group (Co-leaders R.Kadel, M.Pripstein) since beginning '92 until the end of the SSC last October. Therefore, during the second half of 1993 I have been continuing my involvement on the preparation for the ECEM prototype test to be performed at the Cern SPS/PS in the late summer '93, which took place in fact at the end of August until mid-September.

My responsibility was to provide a new DAQ System based on UNIX platform and using VME/CAMAC. This was the "SDC Portable DAQ" named UNIDAQ that was developed for testing of SDC prototypes by members of the SDC collaboration. The system needed to be installed and adapted to our hardware configuration, therefore I participate on its implementation and debugging. LBL was the first group trying to use this system for test beam, therefore I played a major role on the debugging of its components. I was also working on debugging the electronics related to the trigger and read-out. I went to Cern to participate to the test of the calorimeter prototype for the whole length of the test. Since my main occupation and responsibility was in the installation and debugging of the full electronics-DAQ system, I actually spent one week prior the actual starting of the data taking working on the installation of the system.
• In November '93, even though the SSC was terminated, we completed the test of the ECEM prototype at the PS, as already planned, so I went to CERN again to follow up the "new" installation and debugging of the DAQ system and to participate to the actual test.

Both tests were very successful.

• After that, I spent some time looking around and meditating about my future, and I decided to join both LBL groups working on the B-Factory detector and on ATLAS.

– For the B-Factory detector, I started to think about the simulation of the Trigger/DAQ system by using MODSIM (Object Oriented Language). I spent sometime learning the MODSIM language and I participated in some of the discussions about the design of the DAQ system.

I also started to help with the data acquisition for the test of the Particle ID detector prototype (DIRC) that the LBL group is planning to perform in the fall. Still for the DIRC, recently I have been partially supervising a summer student, in particular helping him with the electronics setup and the Labview program for the test of photo multiplier tubes to be used for the future prototype test. I am currently working on setting up the full DAQ system for the test of the real prototype in the fall.

– As part of the ATLAS/LBL group, I will participate on setting up the test benches for the silicon and pixel detectors that the LBL group is planning to test and provide to ATLAS. In the future, probably early 1995, there will be a test at the CERN-SPS of the pixel detector that LBL is going to build, and I will work on the data acquisition and read-out for it. This will require a considerable interaction with the ATLAS/test beam personnel at CERN. I will start establishing these contacts during the next ATLAS week that I will attend at the end of June.

• During the last six months, I also developed a strong interest on the Fibre Channel technology for event building architecture after some discussions with ATLAS collaborators involved in the daq group and daq simulation group. I participated to the ATLAS collaboration meeting at the beginning of the year (end of January) where I also gave a talk to the ATLAS collaboration about the Fibre Channel technology and a possible LBL contribution to the experiment with an R&D consisting of a test bed with a Fibre Channel based switch and VME interfaces. Later on (April), I decided to write an LDRD proposal in which I requested (together with ICSD and Nuclear Science scientists) to be funded for a research and development involving the test of a Fibre Channel based switch with VME interfaces for event building studies. If the LDRD will not be approved and funded by the LBL Director, it seems that unfortunately, for budgetary and strategic reasons, I wont be able to pursue this R&D. I will follow its developments though, and eventually take advantage of it in the future.

• I am currently part of the Portable DAQ group (G.Abrams, P.LeDu and myself). Last year we submitted an LDRD proposal (for continuation) and we obtained funding for FY 94. Its reference is indicated in the list of funded proposal. This year work involves the implementation of a DAQ system using all the control features of the EPICS software for control and monitoring of the DAQ software components.

94-95

1) June '94 is exactly when it became clear what my involvement in the LBL (now LBNL) ATLAS group would be. In fact I started to focus on designing and building the data acquisition system for the silicon and pixel detector test benches. The plan was to implement in parallel two test benches which will evolve from a simple test code and readout modules towards the final ATLAS Test Beam DAQ system, fully compatible from the point of view of both the VME hardware and software. I then succeeded in establishing very good contacts with other ATLAS groups involved in the Inner Detector/Barrel Sector Prototype testing during the ATLAS Collaboration Meeting (ATLAS week) that I attended at the end of June. This was a very special time to be involved in this subject because the discussions of the design of the final ATLAS Test Beam DAQ were just happening and I could still play an important role in the design process, which I did. I kept close communication with the CERN groups while at LBL and then I also attended the September and November ATLAS weeks, continuing the discussion on the same subject. The decision about a common test beam DAQ for the pixel/strips/TRT was finally taken at the end of November and I could finally lead the discussion about the preparation for the Test Beam DAQ system among the silicon strips and pixel groups based on a definite architecture.

2) On the basis of the Test Beam Architecture, I also played a major role in defining the requirements for the design of the pixel/strips DSP readout card.

3) I organized very successfully a one day meeting at CERN on Pixel DAQ for the '95 beam test, where for the first time, several people from the various institutions involved in the ATLAS Pixel system, participated in a common discussion about the pixel test beam DAQ. The pixel system is unfortunately not going to be ready for beam test this year therefore all my efforts to form the Pixel DAQ system/group are on hold for the time being. I believe though that what I have accomplished so far in the organization of the DAQ for the pixel modules, will be resumed as soon as we have a new schedule for testing.

4) In the past few months I have been concentrating my work on the silicon strips only. The test bench is ready to be used (as soon as the chips will be available) and the ATLAS Test Beam DAQ is completely installed and very close to being functional.

5) In March '95, the LBL/ATLAS group organized an ATLAS-SCT workshop which took place at LBL and lasted for a week. The attendance was very impressive (around 90 participants from many US and non-US ATLAS institutions). During that meeting I continued the discussion about common test beam DAQ with my ATLAS colleagues and I organized a very useful session on "Test Beam DAQ" where more details regarding the preparation for this year's test beam running were discussed.

6) From June '94 until December '95, in parallel to my strong commitment to ATLAS, I continued to work on BaBar to fulfill my commitments with the DIRC group. My name in fact appears on the BaBar Letter of the Intent (June '94). I had the responsibility of providing the data acquisition system (readout electronics and software) for the upcoming beam test of a DIRC prototype being built at LBL (the beam test at the CERN PS took place just recently). I was at the point of having a satisfactory system and very close to the final setup, when the new divisional fellow (David Brown), who started to work at LBL last December, decided to join the DIRC group. My commitment to the DIRC project ended as soon as I realized that the overlap with him was enough to pass on to him the responsibility for the DAQ system.

7) Besides my heavy commitments in the DAQ arena, I have been working also on side activities (mostly using my limited spare time) such as the creation of the LBL/ATLAS pages on WWW to improve the communication between the LBL group and the overall ATLAS collaboration, and the participation in the editing of large documents, like the Pixel Backup Document for the ATLAS proposal. This is a large document, 203 pages, whose goal was to provide a complete detailed description of the subject of Pixels for the ATLAS proposal. The proposal itself had a limit on the number of pages set by the LHCC, and therefore couldn't cover in great detail every subject. Many other backup documents were created on the other main topics appearing in the ATLAS proposal. In particular for the Pixel Backup Document I provided in postscript format the many figures appearing in the specific chapters provided by the LBL/Pixel group. My name is included also in the author-list of the SCT (Semi-Conductor-Tracker) Backup Document for the ATLAS Technical Proposal since I am an active member of that group, and, needless to say I am part of the ATLAS Technical proposal. I also contributed to the U.S. ATLAS proposal, a document whose intent was to make a proposal to the DOE and NSF to participate in the ATLAS experiment.

8) The biggest extra initiative I have been taken this year has been the one involving WWW. Last December I thought it was important for the LBL Physics Division to appear on the Web as part of the Scientific Program of the Lab. I proposed this idea to the Physics Division leader and had his approval to go ahead. I therefore called a division meeting where I was very pleased to see that at least one representative of each group attended. Besides the practical use that each group can make of the Web (exchanging information for working purposes), I think that it is very important that students, teachers, etc. can read about our programs using this wonderful tool, namely I believe this is an easy way to contribute to public outreach. I proposed a design of the WWW page that was accepted and in a few weeks (as soon as I received most of the text/figures from most of the groups -- fortunately only in few cases I had to overcome lack of cooperation) I had a preliminary version of the Physics Division page. The page has been improving in the last few months, but I think at this point it is pretty much complete. I have been also active in educating several people on the use of the Web, including the language and the page design, within the Physics Division and Nuclear Science Division. I'm still fully maintaining the Physics Division page (and many of the sub-pages). I'm very pleased with this personal achievement.

95-96

1) The summer '95 Beam Test at H8.

I participated very intensively to the preparation for the summer '95 beam test at H8. My main responsibility was to implement the binary readout part in the general H8 DAQ system, which I could test preliminary at LBNL having the same hardware configuration as H8, and the calibration code for the strips modules. I initially spent quite some time debugging (both on the hardware and software point of view) the DSP boards from UCI which just appeared around the middle of May '95 and for which I had participated in all discussion about requirements in the previous several months. The few weeks before the actual test beam period, I spent long hours in the lab testing the modules as they were being ready to test, working very closely with Carl Haber and Helmuth Spieler. I then left to CERN with most of the DAQ modules and cable in one of my luggage. The beam test took place at the H8 ATLAS test beam in the CERN North Area in the middle of August '95 for 2 weeks, and for one more week in the middle of September. We tested several modules consisting of radiation-hard strip detector, and the readout chain comprising two types of IC's (both of 128 channels): one of the two types of analog chip used utilizing radiation-hard bipolar transistor technology (CAFE), and a digital chip fabricated in radiation-hard CMOS (CDP128). We measured efficiency of inclined tracks, bias voltage dependence, position resolution and signal/noise ratio. The tests were very successful.

I had the responsibility of the binary readout DAQ and played a key role on the coordination and integration of the LBL system into the ATLAS H8 test beam since we were taking data together with the entire ATLAS-strips community.

2) Lab activities.

• I am responsible for the test bench (both software and hardware DAQ) and I am constantly involved in testing of the various modules that are being prepared for different occasions, like irradiation test at the 88" cyclotron, beam test at KEK, test of new modules (like the Z modules) etc. etc. My calibration code and kumac for analysis are continuously evolving and updating for new measurements like the very recent ones involving the laser and the source setup.

• I have been training and supervising the visiting post-doc from Valencia (Julio Lozano) who is going to be with the LBNL/ATLAS group for 2 years. This has been a very successful and rewarding activity since it worked out pretty well and now Julio is more or less capable of doing independent work in the lab and he recently started to be a big help for me on the module testing.

• I have been training and supervising one under-grad student (Juana Rudati) who has been working with me for more than 6 months. The project she has been assigned to concerned the translation of the probe station code from Fortran to C language in the context of moving the chip test stand from VMS to UNIX and from CAMAC/Jorway interface to VICBus. Her work involved learning Unix OS, C and Fortran languages. It took longer than I anticipated but now we are very close to conclude this work. I am also supervising another couple of students (with J. Siegrist) who have been involved in the same project, in particular developing the GUI in tcl/tk, Jason Novotny who just left and Lee Loveridge who just joined the group for the summer '96 (Lee is starting graduate school at UCB in the fall).

• I have been following very closely the work concerning the set up of the laser and source stands, in particular helping out M.Momayezi on getting started especially on the software to control via GPIB the PMC (programmable motion controller) which allows to move the module under the laser beam and perform automatic position and threshold scans. I then performed with Julio all kind of calibration studies of the PMC for reproducibility, corrections for back lash etc. The source setup is under reconfiguration and I have been working on modifying the calibration code to accept external triggers (the ones coming from the coincidence of two PMT when particles are produced by the source).

• I have been helping out the post-doc from Wisconsin (Daemon Fasching) on getting settled with the test of the readout boards for the pixel system. I provided him with the framework necessary to test and develop pixel-DSP code and debug of the PLL (Pixel Low Level Card), i.e., the hardware consisting of the general DSP readout board in the VME crate used for the strips (strips and pixels are still in a sharing mode for the moment until we duplicate the DAQ hardware) and all the software used for the strips calibration, most of which is in common between the two systems and can be used as a model for the development of the calibration code for the pixel.

In general, I provide leadership and guidance for lab newcomers (students and visitors) and I try to keep things moving whenever there is a vacuum in the leadership of the lab activities, a position in which I find myself very often being very much involved in everything is happening in the lab.

3) Support to the European groups.

I have been very much involved in helping European groups to setting up their test benches for binary readout modules. Besides being one of the main hosts for visiting people to our lab, I have been one of the main people in the LBNL/Atlas group responsible in providing a working readout system, calibration code, and calibration data analysis paw tools (kumac). This is quite an involving activity and it requires keeping in contact with the various groups (so far University of Geneva-CH, Liverpool-UK, Cambridge-UK) whenever they need to consult for problems. This is a quite satisfactory activity and I think very important for the continuos success of the binary readout.

4) Preparation for the summer '96 beam test at H8.

I am clearly completely involved in this crucial preparation. This involves the complete test and calibration of new modules (two irradiated at the 88" cyclotron and one not irradiated to be used as reference), the completion of the laser studies (strips uniformity, boundary etc.) and detector signal levels with the source. In addition, my primary responsibility involves the complete test of the DAQ system in order to solve problems (both hardware and software) that can be much more difficult to deal with once we are at H8 and just before the starting of the actual data taking.

5) WWW activity.

This is a side activity I pursue mostly in my spare time, and I consider very crucial since it allows the LBNL/Atlas group to be in complete contact with the rest of the collaboration in exchanging information, papers, documentation, etc., it has been attracting students to work with the LBNL/Atlas group, and in general it gives the group some extra visibility.
I also still keep maintaining the LBNL Physics Division page and besides the ATLAS subpage, some of the other subpages (like the ones of BaBar, and Physics division memos – whenever Betty or Judy need to put on the Web something like agendas of Reviews)

97-98

1) Lab activities.

STRIPS

• I am responsible for the strips test benches in the LBNL ATLAS Lab (both software and hardware DAQ). The following is the list of activities I have been performing to fulfill this responsibility:

⇒ I keep updating the calibration code with improved I/O features, a new version with ABC/ABCD readout, and settings and controls via the Cambridge Bias-Card (BC96).

⇒ I am making the calibration code portable between VME-processor (RAID) and PC/NT/NI system, and I will ultimately release a version for distribution to the ATLAS SCT community.

⇒ I continue to improve the DAQ system, in particular, my future goal is to build a GUI in Labwindows for the PC/NT/NI system, and a version of the code optimized for irradiation tests (this is actually very close to be completed).

• I have an active role within the ATLAS SCT community. I'm the LBNL contact for the SCT-DAQ group which involves discussions on common choices for test benches based on standard platforms and readout systems, portability of code for strips readout, systems for irradiation tests.

• I participate on testing chips, when bonded on a hybrid.

• I supervise, and mostly give support to the work of a Post-Doc and a Visiting Scientist within the LBNL Strips group: besides participating directly on testing, debugging and writing code for chips/ hybrids /modules, I also support the work of others by helping with computing problems, locate hardware equipment, get mechanical parts built, debugging of various parts of the system.

In particular, just in the last month, I helped, quite substantially, to get the ABC/ABCD test going and up to speed. And a few months ago a spent quite sometime teaching Labview to our visitor (including Carl) while trying also to understand and debug the Labview code from RAL for the module assembly setup.

PIXEL

• I have been participating to the April '98 beam test at the CERN H8. I helped with the DAQ installation at H8.
My involvement with the pixel group at LBNL consists mainly on providing support and advise for computing and test bench setup. And of course, help with documents editing, graphics, WWW pages as part of my misc. activities (see below).

2) Miscellaneous Activities.

• **Computing**: I manage in detail the computing needs of the group. I make sure that machines are upgraded, the software properly installed and running, that enough disk space is available for all our needs, and all our new students/visitors are all set to work.

• **Office space**: I follow in detail the office space problem. In particular, whenever a new student/visitor joins the group I make sure that a suitable space becomes available and it's ready for them.

• **Lab space**: I have been providing all along useful ideas (I think) on how to use the space more efficiently between the strips and pixel project (including pixel mechanics). In particular, the current arrangement follows entirely a proposal I made last year and I keep improving little details when needed. In general, I follow, coordinate rather, on a volunteer basis, the operations in the lab, concerning improvement of the layout, finding equipment (and get rid of obsolete equipment!), make sure people follow basic rules, make sure people are aware of radiation safety rules, and try to keep it clean and organized.

• **WWW**: I create and maintain the LBNL ATLAS Web pages with continuous updates of documents, figures, pictures and text for both pixel and strips projects. And I still take care of the Physics Division Home Page (including providing support and guidance for the administrators who helps maintaining a few pages like the Division Office News and Seminars). I carry on my WWW activities mainly during my own time, outside the regular working hours, except for the scanning operations which clearly I have to do necessarily in my office where the scanner is.

98-99

1) Strips and Pixel.

• **Strips:** I produced a PC/WNT version of the old calibration program, calabc (last year upgrade of calrun with ABC-CAFÉ and ABCD readout). We have used calabc on a RAID-CES processor running Lynx-OS in VME extensively until a few months ago to test strips modules. Both versions don't include a Graphical User Interface (GUI) but only in-line I/O interface. I then felt we needed a new version of the same code equipped with a nice Graphical User Interface. I just completed this task by porting calabc in Labwindows/CVI. This system still addresses the traditional readout boards (DSP and BC96) but my goal was to have an improved backup solution in case the next generation of modules will be ready before the new test system is completely debugged. In addition, this would let me exercise the capabilities of Labwindows and get the necessary expertise to be able to develop in that environment the next generation of code for the new test system. Only very recently, we have decided to go in the direction of ROOT and C++ programming language, namely to write a program using ROOT as a complete framework including GUI, DAQ and monitoring with the new test system. I'm in the process of learning C++ and developing the ROOT system to run on WNT using Visual C++.
My program in Labwindows will therefore serve the only purpose of being a backup system.
I'm also supervising the visiting graduate student from Valencia who is participating on this new development for the summer.

• **Pixel:** I started a few months ago to be involved in the evaluation of database systems suitable for the pixel production database. In particular, I have been getting more and more familiar with the system developed for the SCT project (Oracle based, with Web interface and Java scripts). I have initiated a discussion with the SCT about the possibility of implementing the pixel interface in their system or developing a similar system in parallel.

2) General Activities.

- **WWW:** I create and maintain the LBNL ATLAS Web pages with continuous updates of documents, figures, pictures and text for both pixel and strips. I also maintain the Physics Division Home Page (including providing support and guidance for the administrators working on maintaining the pages such as the Division Office News and Seminars).

- **Local Computing:** I manage the computing needs of the LBL-ATLAS group. I make sure that machines are upgraded, any software is properly installed, enough disk space is available for all group needs, and all new students/visitors are all set to work efficiently.

- **Office space:** I follow the office space problem. In particular, whenever a new student/visitor joins the group I make sure that a suitable space becomes available and it's ready for them.

- **Lab space:** I have been providing all along useful ideas (I think) on how to use the space more efficiently between the strips and pixel project. In general, I follow any operation in the lab, concerning improvement of the layout, finding equipment (and get rid of obsolete equipment!), make sure people follow basic rules, make sure people are aware of radiation safety rules, and try to keep it clean and organized.

3) CSAC and CCSC.

Last October I was nominated by Jim Siegrist Computer Liaison for the Physics Division and asked to represent the division in two lab-wide committees, CSAC (Computing and Communications Services Advisory Committee) and CCSC (Computer and Communications Security Committee).

CSAC serves as an advisory committee to Computing Sciences by providing input regarding Computing Sciences services and its infrastructure in support of Berkeley Laboratory. CSAC serves Berkeley Laboratory by advising Division members of current services available from Computing Sciences. I have been heavily involved in this committee since the beginning by playing a major role in advising the Lab management to change the LBNL home page in order to emphasize its scientific look (the current page clearly lacks of that). I have been asked by the CSAC chairman to form a CSAC sub-committee to advise directly the Public Communication Department and the Lab management on this task. I have written a two-page memo on behalf of CSAC and presented it to the committee during one of our meetings. I then personally presented it to Pier Oddone and got his approval to go ahead with this idea. I subsequently had a meeting jointly with Pier and Ron Kolb to discuss the points and concerns expressed in the memo and all recommendations where accepted. We should see a new improved LBNL web page this summer.

The Computer and Communications Security Committee (CCSC) is chaired by the Computer Protection Program Manager (CPPM) and includes Computer Security Liaisons from each division. The CCSC assists the CPPM in developing, implementing, and administering Lab computer security policies. One of the first things I was asked to provide as I became part of this committee was the complete list of all the computers in the Physics Division (and all their relevant information) to be used for the Lab-wide computer security database (now very close to completion). This was a big task that took over three months to complete (with great help from Jim Dodge) and my list was the first one to be provided to the CPPM and clearly made the Physics Division to look good.

Both committees meet once a month.

1999-2000

Over the summer of 1999 I worked on the software for testing of ABC/ABCD SCT modules. The system was developed on Visual C++ for reading out through the VME/FPGA board designed by H. Niggli and used ROOT for data display and analysis. I worked together with (and supervised) a visiting graduate student from Valencia who was participating on this new development for the summer.

I participated on the SCT test beam in September '99 at the H8/CERN. We tested quite successfully single sided modules with ABC and CAFÉ chips.

During my visit at CERN I also organized a meeting with the University of Geneva group and invited a few representatives of the pixel community to evaluate the Data Base system that the Geneva group had been developing for quite sometime for SCT. The result of that meeting brought to the decision of adopting the same system for pixel. Later on I was nominated the contact person for the pixel electronics and disk mechanics production database.

2000-2001

SCT Wafer Screening Test System

In March 2001 I took on a leadership role for the continuation of the production of the SCT ASIC Test System started by H. Niggli (who left on March 17, 2000). The system at that time considered near completion was expected to be used by the SCT collaboration, in particular by the three wafer screening sites: CERN, RAL and UCSC. My job consisted of coordinating the production of the new intermediate boards (the so-called Pindriver and Connector Boards), the debugging of the already existing VME board equipped with FPGA and run with a complicate VHDL code, and the design of new probe card. The system turned out to be not near completion at all and most of year 2000 was spent performing an infinite amount of hardware debugging, VHDL completion and debugging, and production of all new upgraded boards. The first working system was delivered late in the year. Besides the coordination of the hardware production I also had to follow very closely the production of the on-line and off-line software done outside LBL (at CERN and Valencia) and this has been quite a challenging job as well. We delivered the first 3 final systems at the beginning of 2001. The last few months have been quite intense trying to solve the remaining hardware problems and mostly to get the software to be fully operational and robust. The PRR of July 4 increased the scope of the project greatly because of the need to demonstrate by that deadline all sites could perform wafer screening within the smallest marginal difference. With all the institutions involved at this point my coordination job has become even more challenging. In April I submitted a paper (an abstract and a summary) about the tester and I prepared a very detailed "Tester Description" document for the PRR. I also produced and still maintain a quite comprehensive set of web pages on this system.

SCT Module testing

I have the responsibility to set up and carry on the production module testing and burn-in at LBNL. I am currently testing one hybrid (in particular temperature dependence of noise, gain and offset measurement) and supervising one under-graduate student (who will write a thesis on module electrical performance at the end of his work in the spring 2002) and 2 interns students.

I'm planning to set up a multi-module and multi-hybrid test system and burn-in for the 700-module production starting next year.

CSAC and CPIC

In parallel to my research work I continue to serve in the Computing and Communications Services Advisory Committee (CSAC) as the representative of the Physics Division. Since the beginning of the year I chair a CSAC-ITSD working group that is investigating whether an institutional mid-range computing resource would be appropriate and/or sustainable for Berkeley Lab. We just produced, in fact, a formal document (Assessing and Defining the Future of Institutional Scientific Computing Resources at Berkeley Lab) in which we present our goals.

This effort will involve an informational campaign to raise awareness of the increasing role of computational science. This will be followed by surveys of individual researchers and Lab groups to assess the level of interest in an institutional resource. If there is sufficient interest, a procurement process and a sustainable financial model would be finalized. Lastly, the findings and recommendations will be presented in a detailed and implementable proposal to Laboratory management for consideration.

I'm also a member of the Computer Protection Implementation Committee (CPIC, former CCSC) as a liaison for the Physics Division. In fact, a few months ago I chaired a CSAC sub-committee to redefine the role of this committee and rewrite the new charter for its members.

2001-2002

1. ASIC Wafer Tester and PRR.
   I completed the ASIC Wafer Test system for the SCT. 3 complete systems are fully operational at the 3 SCT wafer testing sites (RAL, CERN, Santa Cruz) and well advanced into wafer production testing. Last year, July 4th, I participate in the PRR (ASIC Production Readiness Review) at CERN providing also a document describing the ASIC Wafer Test System.
2. SCT module production testing
   I set up the SCT production test system for hybrid/module test and burn-in at LBNL.
   This work is my main responsibility in the SCT group. Three research assistants are currently part of this team (one of them, B. Jayatilaka just recently graduated – see below for additional work/thesis supervision).
3. Irradiation test
   See below (Other Accomplishments)
4. Web development
   I develop and maintain a large number of web pages documenting my work and helping documenting much of the LBNL ATLAS group work.

1) One of the most notable accomplishment during this review period has been the irradiation test of a 12-chip hybrid at the LBNL cobalt-60 source facility that I carried on in parallel to my principal responsibility to setup the testing facility for the SCT module production. The irradiation test lasted for 4 months (Dec-Mar) and the annealing process 2 months. During this entire time I monitored very closely the experiment, made the results available on the web regularly, and supervised the student (Bo Jayatilaka) who graduated in May, writing a thesis on this subject.
We also produced a paper that will be submitted to the SCT collaboration very shortly.
2) Local organizer for Pixel 2002 Int. Workshop: I participate in the various discussions and produced the official web pages for the workshop
3) WebMaster for ATLAS and Physics Division
4) Local Computing: I manage the computing needs of the LBL-ATLAS group. I make sure that machines are upgraded, any software is properly installed, enough disk space is available for all group needs, and all new students/visitors are all set to work efficiently.
5) Lab space: I follow any operation in the lab, concerning improvement of the layout, finding equipment, make sure people follow basic rules, make sure people are aware of radiation safety rules, and try to keep it clean and organized.

> Awards: Last March, in recognition of my service in CSAC and particular efforts and achievements in helping the lab's strategic planning in the area of computing, I received an OPA from Sandy Merola (ITSD director).

In parallel to my research work I continue to serve in the Computing and Communications Services Advisory Committee (CSAC) as the representative of the Physics Division. Since early 2001 I chair a CSAC-ITSD working group (MRC WG) which goal is to investigate whether an institutional mid-range computing resource would be appropriate and/or sustainable for Berkeley Lab. Last fall this WG produced a formal document (Assessing and Defining the Future of Institutional Scientific Computing Resources at Berkeley Lab) in which the assessments, findings and goals are presented.
On March 26, I organized (together with my WG) a Mid-Range Computing workshop that gathered both scientists and computer sciences staff (about 40 people including the highest level of computer sciences management) to discuss MRC at the Laboratory. Prior to the March 26 workshop, the working group conducted a survey of current and potential users of Mid-Range Computing resources (mostly computer clusters) to assess the status and possible futures of MRC at the lab. The workshop was divided into two sessions: Lab-wide and shared resources were primarily addressed in presentations in the morning session, which I chaired. Support of existing and future clusters was discussed in a roundtable session in the afternoon. The summary and minutes of the workshop, as well as the results of the survey obtained prior to the workshop, can be found on the MRC web pages (under http://www.lbl.gov/ITSD/CSAC/ go to

working groups). I am currently working on submitting the Proceedings of the Workshop as an LBNL report.

2002-2003

SCT hybrid and module production

1. USA Site Qualification
   I worked intensively on the electrical testing of the 5 qualification modules built at LBNL and produced all the results and related documentation. I also worked closely with the LBNL and UCSC groups to bring together all the required documentations for the official Request for the USA site qualification in the form of a web page, following the "Barrel Module Assembly Site Qualification Procedures and Criteria".
2. USA Hybrid and Module Production Testing
   During the Qualification period I brought the hybrid/module production test setup to completion with 4 stations (one for single hybrid testing, one for 6 parallel hybrid burn-in, one for single module, one for multiple modules in the environmental chamber for temperature cycling and longterm tests) fully operational.
   This included a proper installation of the DAQ components, hardware and software; to follow the design and construction of special cables for the high voltage in conjunction with custom designed noise filter cards to properly meet the requirements of the ground scheme that would reduce significantly the deadly effect of external noise sources.
   In addition I followed the production of additional cards (Patch cards) necessary in a large quantity.
   I have been devoting a significant effort on the archive methods through the development of a large number of perl script , excel spreadsheet, and web pages.
   All the data, plots, results, progress reports are promptly available on the web and continuously updated.
   Besides keeping up efficiently with the production, I constantly put much of my effort on the analysis of the electrical performance of hybrids and modules, including the development of the code for the comparison with the wafer data. Examples are the studies I conducted on ASIC performance, such as the “large gain spread” effect observed in 1% of the ASIC’s, that would lead to the decision to whether or not keep those ASIC’s already mounted or allow a pre-selection of future ASICs before they are mounted on hybrids.
   Another main subject of my analysis work has been on the S-curves oscillation observed at very low threshold in about 50% of our modules during the noise occupancy test. I made the results of all these studies available in a form of a report and web pages with exhausting collection of excel spreadsheets and plots.
   Production started in the fall ’02 and up to now 121 hybrids have been fully tested and burn-in, and 56 modules have been tested and undergone temperature cycling and longterm tests.

3. SCT Collaboration
   I keep a very close and good relationship with the rest of the SCT collaboration, through a continuous exchanging of results, ideas and reports.
   I lead the local group of two research assistants, two URAP students (now gone), and a retiree working with me on the hybrids and modules production testing.
   I interact with pleasure and efficiently on a daily basis with the technical staff building the hybrids and modules that I test.

I continue to serve in the Computing and Communications Services Advisory Committee (CSAC) as the representative of the Physics Division.
I led a two-year project to evaluate options for enhancing the scientific role of midrange computing at the Lab, culminating in the 4 year Scientific Cluster Support program, a lab funded program designed to increase the contribution of scientific computing in Berkeley lab research projects by facilitating the use of Linux clusters.
I have been recently appointed to chair a Steering Committee that will provide governance and will help ensuring the success of this very important program for the Lab.

2003-2004

USA Hybrid and Module Production Testing
- Lead a team of 5 to carry on the testing effort including a very productive interaction with technical staff
- QA responsible for the US SCT module production: test data analysis, documentation, detailed summaries and status reports, data logging and database, shipment.
- Intense interaction with the SCT collaboration, through a continuous exchanging of results, ideas and reports.
- Full participation to SCT meetings at CERN

I serve in the Computing and Communications Services Advisory Committee (CSAC) as the representative of the Physics Division.

I chair the Steering Committee for the Scientific Cluster Support program (4 year Laboratory-funded program) developed to address the difficulties of obtaining and running a Linux cluster system. The ultimate strategic goal being to increase the use of scientific computing to Lab research projects, to introduce parallel computing to Berkeley Lab researchers and to develop efficient, cost-effective methods for managing production clusters.
I work with Tammy Welcome, deputy director of ITSD and a few committee members representing some of the other scientific divisions.

I serve in the Computer Protection Implementation Committee (CPIC) as the representative of the Physics Division.

I am President of the Board for the Science Camp at LBNL.
The camp is a non-profit corporation entitled Science Exploration Camp (SEC). SEC is administered by a volunteer board of directors. The Camp provides a mix of recreational and science-oriented activities for elementary school-age children of Berkeley Lab employees and it's open to the General Public. My involvement with this activity included the hiring of all the staff required to run the program, and preparation, planning of the program together with the rest of the board members and the camp director, also hired in this process.

2004-2005

USA Hybrid and Module Production Testing
- Lead a team of 5 to carry on the testing effort including a very productive interaction with technical staff
- QA responsible for the US SCT module production: test data analysis, documentation, detailed summaries and status reports, data logging and database, shipment.
- Intense interaction with the SCT collaboration, through a continuous exchanging of results, ideas and reports.
- Full participation to SCT meetings at CERN with status reports
- Successfully completed QA and shipments according to the schedule
- The US cluster was the first one to meet the schedule of the deliverables

- Helped collaborators from UK and Scandinavia coordinating rework some of their modules
- The conclusion of the US module production was a huge success culminating with a memorable talk that I presented at the September SCT week
- Before moving to CERN to work on installation, I had for a few months a taste of what doing Physics in ATLAS would look like. I learned how to use the Athena framework and worked on physics production of background and SUSY samples for the ATLAS Physics Workshop in Rome (June 2005).

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Since I relocated to CERN in July I had to resign these posts.

2005-2006

In the summer of 2005 I relocated to CERN to be involved in the integration and installation of the SCT. I took on right away the coordination of the production, installation and testing of the SCT Cables.

That was a quite challenging job, which involved a lot of details, steps, and precise sequence to follow over a long period of time and with a pressing schedule tightly coupled to the overall ATLAS schedule. The connectivity mapping of all the cables going from one patch panel to the other, and to the power supplies was a job I shared in part with Pippa. I was coordinating a large group of technicians, engineers, and physicist/students from the SCT collaboration over a period of almost two years coming to CERN to help with the testing work and with the preparation of the cables to give to the installation crews. I managed the shifts, schedule and training. People where mostly rotating, but about 10-12 people where present at CERN at any given time. That was a good way to make the entire collaboration feel united by being involved in the installation. I had quite frequent interactions with the ATLAS Technical Coordination who was managing the installation teams. I followed with Pippa the production of the different type of cables, solving technical difficulties and problems, with necessary interactions with the companies. Cables at the Power Supply end were cut to length and connectors are built in situ. I followed the work of an external company that performed the connector work for six months over a period of one year. That included qualification, schedule negotiation, and update technical documentation.

Coordination of production, installation and testing of the ATLAS SCT Cables.

http://www-atlas.lbl.gov/ciocio/SCTcables/

The work includes:

1) Mapping and connectivity of type II-III cables going from Patch Panel 1 (PP1), the panels where cables connect on one side and the detector cables on the other, to Patch Panel 3 (PP3), the panels in racks around the ATLAS detectors; and type IV cables from PP3 to the Power Supply racks on the other side of the wall of the cavern. The total number of cables joint at the Patch Panel level is of about 9,000, with 4088 PP3, and about 600 PP1.

   https://edms.cern.ch/document/624679/1

2) Follow the production of the different type of cables, solving technical difficulties and problems, with continuous interactions with the companies. Made sure the production would meet the installation schedule.

3) Coordination of testing of all the cables before installation and after installation.

4) Cables at the Power Supply end are cut to length and connectors are built in situ. I followed the work of an external company that performed the work on half of the cables over a period of 3 months. That included qualification, negotiation, writing a technical appendix, and training.

5) Coordination of a large group of technician, engineers (and physicist/students) from the SCT collaboration over the year coming to CERN to help with the testing work. People where rotating, but about 10-12 people where present at CERN at any given time. Managed the shifts, schedule and training.

6) Coordination of a large effort to prepare type II-III cables for installation. All 4088 were prepared on time (3594 are just being installed over the last 5 months).

7) Since I provide the layout and mapping I followed very closely the installation (routing) of all cables performed by large teams of Russians, Czech, Polish, Slovak technicians from Technical Coordination (Nessi).

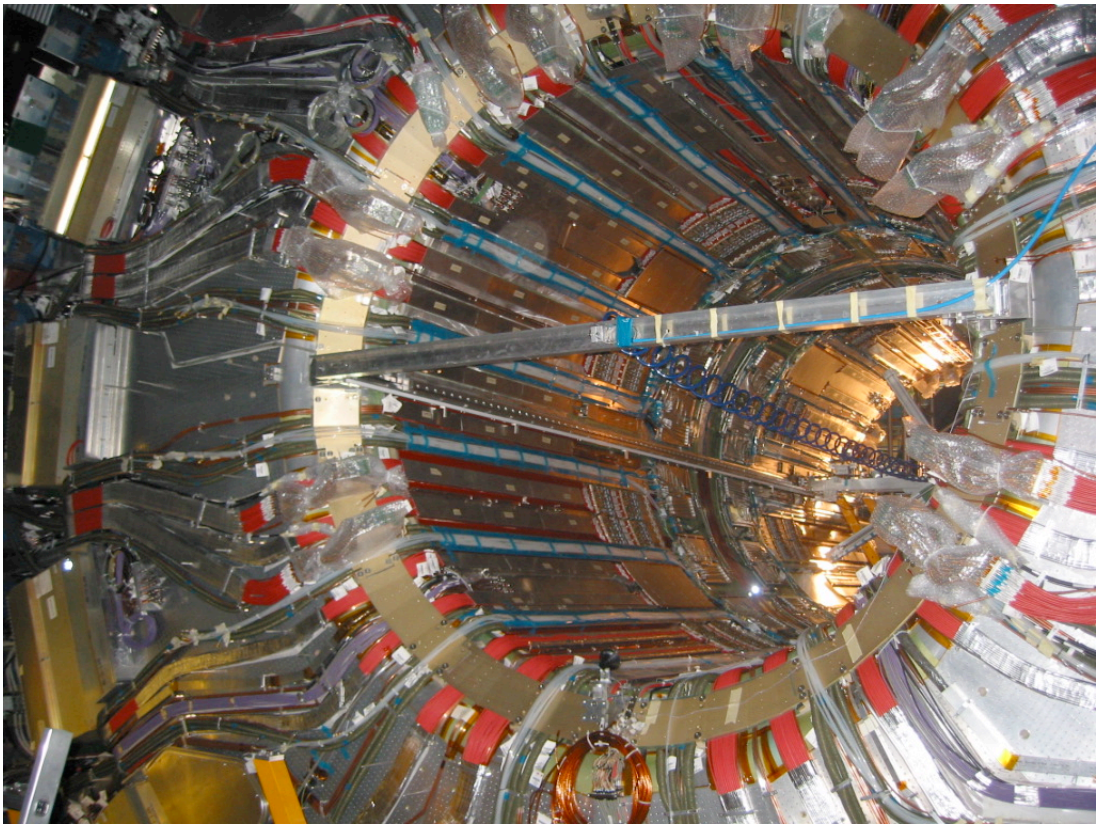
8) Follow the installation of Power Supplies since type IV cables are to be plugged-in there.

9) Update work packages (safety document that describes all work involved in SCT services installation)

   https://edms.cern.ch/cedar/plsql/doc.info?cookie=4472725&document_id=593278&version=2

10) Status: 4250 type IV cables are installed and tested, 2000 cables terminated with connectors on one side (US15). 3600 type II-III cables from cryostat to PP3 racks are installed.

Picture of the cryostat side C: the red bundles are the SCT cables



11) Since September 2005 I'm part of the SCT Steering Group and I am participating to monthly meetings of the SCT Steering group where I present status reports

12) I participate to the ID weeks where I also present status reports of SCT services installation

13) I participate actively in ID installation steering group meeting (weekly – with M. Nessi) and Control Room Management meeting (weekly – with P. Perrodo and G. Mornacchi) where I represent the SCT services installation

14) I became an ATLAS guide and I have been giving several tours to general public, students, colleagues and lately a VIP tour to DOE (including Stuffin).

2006-2008

When the detector was finally installed in the pit, I participated to the connectivity test of the Low Mass Tape cables for the Barrel (Nov 06 – Jan 07), and then coordinated the LMT connection and testing for the Endcaps. After that, I could finally start to work on the commissioning of the detector.

As deputy SCT commissioning/system run coordinator, I have been following since mid 2007 the day-to-day operations, both during commissioning or when running in ATLAS.

We participated in various combined runs, and calibrated the best we could the detector to be ready for the first beam, that we saw with a huge excitement.

After the LHC stopped, we started a long period of cosmic run, where we had the opportunity to also study our timing, identify problems that required short-term and long-term solutions, perform more calibration, and establish a stronger relationship with the offline.

Besides following the performance studies of the detector, I have been coordinating the training programme for all SCT collaborators, using a real SCT barrel sector prototype, that I helped with its refurbishment (Didier Ferrere coordinator) last Spring.

The sector is equipped with real barrel modules (the original spares), operated with very close to real DAQ, DCS systems, as well as cooled with evaporative cooling system. The training started at the beginning of July, and is still going on almost non-stop since then. This was also a very good opportunity for the students that got involved with this installation to see a real piece of the SCT.

About 100 people are in the list of trainees, more than half reached qualification, after taking overlap shifts at the experiment, and were able to take real shifts.

I have been very busy in run coordination lately, running the daily meetings to follow the day-to-day progress and also organizing several of the last SCT commissioning meetings where I tried to bring together the detector side and the offline.

I am a member of the SCT Steering Group, ID Steering Group. I participate to all the meetings and discussions of the ATLAS Run Coordinators, and I attend, representing the SCT, the OPM meeting. I am also the SCT contact for the ID DSS.