Department of Physics Salaries

This note argues for increased unit merit salary for the Department of Physics. In order to be competitive we will need an increase of roughly $300,000. We recognize that this will be difficult to achieve in a single year and that funds will need to be awarded over several years. This year we request $100,000.

Due to the high quality of the department we are in fact very compressed. We hire faculty at a competitive level, but their salaries quickly fall behind. We just end up competing with each other for raises. It is difficult to award several faculty unusual merit money when so many are deserving. We are guessing that no other high quality department on campus has such a flat pay scale. Many departments have recognized superstars, who they can pay considerably above the department average. We also have superstars, but since the overall quality of our faculty is so high, it would be unfair to their colleagues to pay them at the level that the market demands. We are very fortunate that their loyalty to CU keeps them at Boulder.

The Department of Physics possesses large, cohesive groups which have been internationally ranked for several years. The department has steadily improved its stature by targeting areas of need, by obtaining the top researchers in the world, and by staying committed to improving the quality of CU. The fact that we have not lost faculty to external offers should be considered a bonus. Our faculty each year obtain offers which they turn down before seeking a retention package.

Public AAU Comparison Group

According to Lou McClelland’s Salary Website comparison document, the CU Department of Physics full professors make $9,838 or 11.4% less than the average of the comparison group and averaged over all ranks we are 7.6% or $5,879 below the average. Full Professors at CU make an average salary of $76,239 per year. Our average age (55) is same as the AAU peer group.

First, it is instructive to assess whether the CU’s Public AAU Comparison Group is a fair measure of the quality of our department. In the 1999 US News and World Report our department was ranked 25th including all institutions (public and private) and 15th among all Public AAU Universities. In the 1995 Gourman Report we were ranked 33rd overall and 20th among Public AAU. Further we can make a strong argument that we will be ranked higher in future rankings due to the awards we have garnered (particularly among our recently hired faculty, Radzihovsky, Andreev, Dessau, Murnane, and Kapteyn) during the past five years. We find that only nine of the top ranked physics departments (top 25 or better) are in CU’s Public AAU Comparison group. In the area of Atomic, Molecular, and Optical Physics there exists no Public AAU institutions ranked above CU. We argue that CU’s Public AAU Comparison Group is not a good match to the department’s quality.

Second, if one uses the nine institutions which are comparably ranked and in the Comparison Group, then one finds that none of these institutions has a lower salary in physics than CU and we are $16,500 per faculty member below the average of these institutions.
Third, our department has 140 PhD students and $14 million dollars in contracts. It is sobering to learn that at Colorado State University (39 PhD students, $2,150,000 in contracts) full professors in physics earn $1,000 per year more than CU physics faculty, that Colorado School of Mines (14 PhD students, $1,590,000 in contracts) physics faculty earn $6,000 per year more than CU physics faculty, and that the University of Nebraska (34 PhD students, $2,927,482 in contracts) full professors earn $7,000 per year more than CU physics faculty. None of these institutions is nationally ranked in Physics.

Fourth, our department expected to fall last year despite a $50,000 unit merit increase because three of our highest paid faculty retired. Zafiratos ($94,750), Cooper ($96,500), and O’Sullivan ($80,750) retired and our average full professor salaries fell. Effectively, these retirements nullified any increase we might have made relative to our peers.

**Public AAU Comparison Group Salaries**

In Physics we have an annual Midwest Chairs report (Michigan) and an annual national salary survey conducted by Florida State University. Using these documents it is possible to obtain the average of the full professor salaries and the percent salary increase of institutions comparably ranked. Using public institution physics ranking (CU 15th, 4.61% increase) from schools on our AAU comparative list, we find salaries and percent increases at University of Illinois (ranked 2nd $104K, 4.4%), University of Michigan (ranked 4th $90K, % not available), Ohio State (ranked 15th $97K, 4.6%), University of Wisconsin (ranked 11th $95K, 3.6%), University of Washington (ranked 8th $82K, 7.62%), and University of Maryland (ranked 6th $121K, 9.15%). (We were unable to determine the salary increases for Berkeley, UCLA, and Texas) These six institutions have an average salary of $98K, more than 22% above us. We also find an average percentage raise of 5.87% which is 1.3% more than we received last year. In this category we find a much bigger difference in salary than just taking the average of all institutions in the survey. It is clear that good departments are paid well.

**Salaries at CU**

Certain departments at CU have been targeted to remain nationally competitive on salaries. Regrettably, we have been overlooked possibly because of our size. The full professors in our cognate department, APS (nationwide, more than 70% of all Astronomy faculty are rostered in Physics Departments), are competitive on salaries while we are not. There is a $6,000 difference in salaries even though our national CU Public AAU Comparison Group average salaries are the same. Remarkably, our department’s quality demands high salaries, yet only one science department (EPOB) in A&S has full professors making less than in the Department of Physics.

**Comparison to Engineering**

It is completely justifiable to make a comparison with the College of Engineering salaries. Nationally, approximately 10% of the physics departments are rostered in engineering colleges. In addition the Department of Physics at CU is the only A&S department that offers degrees to students from both the College of Engineering and the College of Arts & Sciences. We have
several faculty who write joint proposals with faculty from Engineering: Professors Clark, Wierman, Cary, Dessau, Rogers, Anderson, Price, Ritzwoller, Rundle, and Wahr have written joint proposals with Engineering faculty. There are even several Engineering faculty who belong to centers directed by Physics faculty - CCCC, CIEI, ICE, and FLCRMC. Typically the Engineering faculty make 25% or more than their Physics counterparts, not because of quality or market demand, but strictly because of the college. Why are physics salaries at CU so low just because we are in A&S? It is not possible to make the argument based on market demand or on quality. Last year’s US News and World Report rated CU’s Engineering College as 33rd in the country and none of the engineering departments was ranked in the top ten. Several of our graduates have formed their own companies. Lastly, two of the most decorated alums at CU by the College of Engineering are RC Mercure, co-founder of Ball Brothers, and Charles Schloss, founder of Schloss Engineering Equipment. Both are in fact physics graduates.

Highlights of this Year’s Achievements

The Department of Physics at CU Boulder is an internationally recognized department. The department has 43 regular faculty, 1 instructor, 9 Professors Adjoint, 1 Research Professor, 5 Professors Attendant Rank, 18 Professor Emeriti, and 22 Lecturers. The 2001 American Institute of Physics study showed that CU-Boulder Physics Department has the 7th largest undergraduate program with 228 majors. The same study also showed that we have the 10th largest graduate program.

Our teaching may be judged by the success of our students with roughly half of our undergraduate majors on the Dean’s list. Our Engineering Physics majors have the highest average GPA in the College of Engineering and our A&S Physics majors have the third highest GPA in the College of A&S. This remarkable success is achieved despite the fact that our department ranks near the bottom in average grades given. Our graduate students are amongst the best in the country. For the past three years the top Ph.D. thesis in the US in Atomic and Molecular Physics has been awarded to one of our students.

We also have been active in developing new courses. We now offer freshmen Physics Honors courses and a variety of machine shop mini-courses which are available to all students. We have integrated into our lower division sequences personalized Computer Aided Problem Assignments. We have continued offering technical writing courses for our undergraduate and graduate students. Finally, we continue in the third year of a program called Optical Science and Engineering Program (OSEP) with major support ($2.7 million) being provided by NSF. A major new innovation has been to develop a ‘help room’ staffed forty hours a week by faculty, postdocs, and graduate students. Finally, we are placing graduate students to become future faculty in other Colorado four year institutions via grant from the American Association of Physics Teachers.

Our service as a unit is equally impressive. For the past 24 years we have offered the CU Wizards program for students in grades 5-9. We have been host to the NSF- Research Experience for Undergraduates for the past 13 years. We have been the permanent home (during the month
of June) to the Theoretical Advanced Study Institute in Elementary Particle Physics since 1989. Last year we became the home for the Boulder Summer School in Condensed Matter Physics which is convened during the month of July. This coming summer we will be host to the US Accelerator School. In addition our faculty have developed a new program through the CU Science Discovery Program on ‘Light, Polarization, & Liquid Crystals’ and one faculty member participated in a science television program called ‘Convection Connection.’

The department research continues to shine. The Department of Physics has won several awards during the past year which are good indicators of unusual quality. Of particular significance is the MacArthur Fellowship won by Margaret Murnane. Physics has now won two of the four fellowships awarded to CU. A list of awards won by the faculty since 1993 is attached.

**Conclusion**

We are under a considerable threat to lose the excellence of this department because of lack of recognition (as reflected in salaries) by the University of Colorado and by the knowledge of this by our peer and above-peer institutions. We must be proactive and raise department salaries at least to the level of average of the CU Public Comparison Group!