

# SCOPE

GRAND RAPIDS, MI

CALVIN COLLEGE PHYSICS AND ASTRONOMY NEWSLETTER

FALL 1998

## SUMMARY OVERVIEW

These are dynamic times in the Calvin College Physics and Astronomy Department as the "first generation" of faculty depart and new faces appear. Howard Van Till surprised us all by taking early retirement mid-year 1997-98. Now only Roger Griffioen remains of the original faculty, and he is due to retire next spring. Joining the department this fall in a new tenure-track position is Larry Molnar, an astronomer who was most recently at the University of Iowa. Arriving next year will be husband and wife Loren (biophysics) and Debbie (astronomy) Haarsma. That will nearly complete the turnover. Likely there will be one more tenure-track position filled in the next year or two, and then our tenure-track staffing will be stable until the "second generation" begins leaving. Our new faculty are a talented bunch, which helps make the department a dynamic and invigorating environment for staff and students alike. We probably will continue to have short term staffing

needs, replacing persons who are on leave, and we welcome inquiries about visiting positions at any time.

One of the most conspicuous signs of change is the building addition which is rapidly going up on the west side of the science building. It will attach to the existing building where the hallway bends by the junior and senior labs, and again by the electronics lab. Our department will not be moving into the new facility, and probably will for the most part stay in its present location. We are hoping to gain a little more space for offices and research, plus a new classroom or two for working with elementary education students, but plans for the "old" part of the building are not finalized yet.

If you are looking for more details about the department, you are always welcome to visit our webpage at: <http://www.calvin.edu/academic/phys/> this is updated regularly with departmental

news. For breaking news about the building project, you can visit a page maintained by the Chemistry Department: [http://www.calvin.edu/academic/chemistry/build\\_ud/index.htm](http://www.calvin.edu/academic/chemistry/build_ud/index.htm). Also, if you have a home page of your own, and would like its 'link' to join the alumni links already posted on the departmental page, please e-mail our webpage caretaker at [haan@calvin.edu](mailto:haan@calvin.edu).

While on the topic of web pages and computers, we should mention two listserves maintained at Calvin which would be of interest to some of you. Both involve discussions related to science and Christianity. One is for the American Scientific Affiliation and the other is for Christian astronomers. For further information, see <http://mcgraytx.calvin.edu/ASA/index.html> and <http://www.haverford.edu/physics-astro/Haarsma/chr-astro.html> respectively. Would there be any interest in a physics alumni list? Let us know if you'd be interested, and we can set one up. If we do establish one, we'll announce it on our webpage. ✨

## CALVIN HOSTS VISIT BY NOBEL PRIZEWINNER—A WEEK BEFORE HE WINS THE PRIZE

In October 1997, the Calvin Physics Department hosted three lectures by Dr. William D. Phillips of NIST, just days before he was awarded the Nobel Prize. Phillips spoke in the Phys 195 Student Seminar on the "weirdness" of quantum mechanics, gave a departmental seminar on optical tweezers, and delivered an evening public lecture on "Time, Einstein, and the Coldest Stuff in the Universe" to a packed house of more than 200 high-school and college students and members of the community. Because Phillips is a Christian, there was also an informal

lunch with faculty from various departments and physics students at which there was an open discussion on science and faith issues.

The visit was cosponsored by the Distinguished Traveling Lecturer program of the American Physical Society's Division of Laser Science. Phillips was professor Matt Walhout's PhD advisor and postdoctoral advisor in the years 1989-1995. When Walhout came to Calvin from NIST in 1996, Phillips gave him much of the equipment that had been used in the earliest experi-

ments on laser-cooling and trapping of neutral atoms—the very experiments that would later be recognized by the Nobel committee. Little did anyone know that the apparatus would become a working museum piece! Walhout now uses the equipment in his work on laser-cooled and trapped krypton atoms, which is funded by Research Corporation and Calvin College. Calvin senior David Tong worked on the experiments during the summers of 1997 and 1998, and he will continue these research efforts in his senior research project this year. ✨

## DEPARTMENT SEEKS TO ESTABLISH A ROGER GRIFFIOEN SCHOLARSHIP

Our department has obtained approval from President Byker to work with the Development Office in soliciting funds to endow a "Roger Griffioen Scholarship." Roger is due to retire in spring of 1999 after 38 years of distinguished service to the college—and 19 years as department chairman. No one has contributed more to this department and its students than Roger Griffioen, and department members want to honor him with a scholarship that bears his name. Our goal is to raise at least \$35,000 in contributions and pledges

during the remainder of 1998 and 1999, all of which will go into an endowment. The earnings from the endowment would be sufficient to offer one or more scholarships per year to physics majors for many, many years to come. To achieve



this goal, we are contacting alumni and friends of the department and asking for contributions. By the way, Roger knew nothing of the effort until we had all materials ready to go public. Boy, was he surprised!



## SCHOLARSHIPS

Two Calvin students have received physics scholarships for next year. The Van Oosten scholarship allows each department in the natural sciences to select one student per year who is entering his or her junior or senior year for a scholarship. This year the department selected sophomore/junior Jonathan Niehof of Ames, Iowa. The Ivan E. and Rebecca J. Boerman scholarship, endowed in honor of Howard Van Till, presently gives one scholarship per year to an underclassman. First priority is given to renewal, and this year the award was used to renew the scholarship of Justin Smalligan of Grand Rapids. Congratulations go to Jon and Justin, and our thanks go to the Van Oostens and the Boermans whose generosity helped these students to meet the expense of coming to Calvin. Most of our majors are highly recruited by other colleges, and often they are offered much better scholarship packages than we can provide. It means a lot to be able to help students through additional scholarships.



## OUR DEPARTMENTAL GRADUATES OF '98

This past spring four more students earned the right to call themselves Calvin Physics Alumni (which we think most readers will agree is a pretty august group). 1998 also marks the first year in which we achieved complete gender balance in our graduates: 50% men and 50% women. Our new alumni are...

### MICHAEL DEKKER

Mike completed majors in Mathematics and Physics. We don't hold it against him that he has chosen to pursue graduate work in Mathematics instead of Physics. He's just completed a productive summer of research in physics with Stan Haan and is beginning graduate studies at Notre Dame, where he has a fellowship. Mike was Calvin's highest scorer on this year's Putnam team—a team that placed 17th nationally, bettering Calvin's previous best placement of 20th by the 1972-3 team of David Cok ('75), Steve Haan ('73), and David Van Baak ('73).



### SARAH FAY

Sarah completed the secondary education major, with a minor in mathematics, and this fall has begun teaching at Chicago Christian High School. Sarah and fellow graduate Angela Portenga have achieved distinction by publishing a paper "Hey You! Shut the Refrigerator Door!" in the September 1998 issue of *The Physics Teacher*. In the paper they present some of what they did last interim as part of an independent study with Stan Haan, looking at how energy usage of the old refrigerator in the core depends on how frequently and for how long the door is opened. By the way, their basic conclusion was that it is more energy efficient to get everything you need at once rather than repeatedly opening and closing the door.



## ANGELA PORTENGA

Angie also completed a secondary education physics major plus a minor in mathematics. She and Sarah found that the job market is very good for physics and math teachers.

Angie has accepted a position in the eastern part of Michigan at Farmington High School.



## DAVID RUPKE

Dave, another physics and mathematics double major, is a second generation physics alumnus, the son of Stuart ('71).

In his senior research project, David finished building a radio telescope for galactic hydrogen—a project begun by Ed Van Timmeren ('91) and David Streutker



('97). The telescope actually works—as he demonstrated by taking it out on the soccer field and pointing it in the direction of the Milky Way. There was a clear peak at  $\lambda = 21$  cm when the horn was pointed at the Milky Way. The peak disappeared when the telescope was pointed in other directions. David received numerous offers from top universities for graduate study, and in the end decided to accept a fellowship in physics at the University of Maryland. He spent the summer on an archeological dig in the Middle East, having spent the summer of 1997 on physics research in Walhout's lab.



## NEWS OF THE PHYSICS DEPARTMENT STAFF

Howard Van Till surprised us all by retiring in January, 1998, even earlier than he had previously been planning. Roger Griffioen composed the following tribute:

Howard Van Till's career at Calvin College has taken several distinct turns, and he has thus contributed to the college and the Physics Department in a wide variety of ways.

Howard was born in Modesto, CA and graduated from Ripon Christian High School. He showed an early interest in science, and having survived many "home experiments," including some with explosives, he came to Calvin College and graduated with a major in physics in 1960. In 1958 he was married to Betty Van Spronsen, and they have four children, Steven, Roger, Nancy, and Mary. In 1965 he received his Ph.D. degree from Michigan State University, doing his research in solid state physics. He taught at Calvin during the spring of 1965 and showed himself to be an excellent teacher. The state of California beckoned him back, and he did postdoctoral research at the University of California, Riverside and taught at the University of Redlands. In 1967 Calvin recruited him and he joined the fledgling physics department (even though the letter of appointment from the BOT offered him a position as Assistant Professor of Political Science).

Howard's contributions to the college began before he arrived on campus. Via handwritten letters (no email in those days) he provided input into the design of the physics program in the new 4-1-4 curriculum, as well as the design of the new science building which was being planned. Not long after arriving at Calvin, Howard began teaching Astronomy 110, a core course which addresses issues relating science and Christianity as well as teaching about the science of astronomy and the nature of scientific inquiry. Over the past 30 years thousands of students have benefitted from this course and from Howard's insightful teaching about these issues. Partly because of his experience with teaching astronomy, Howard switched from solid state physics to astrophysics and enjoyed a sabbatical year at the University of Texas, Austin and the McDonald Observatory in 1974.

Within a few years after his sabbatical, his first article in *The Banner* appeared, and another phase of his career began. He became a very popular lecturer for local church adult education groups as well as for alumni groups across the country. In 1984 he published the Occasional Paper from Calvin College, *The Cosmos: Nature or Creation*, and in 1986 his first book entitled, *The Fourth Day*. This book stimulated the college

and church to grapple with important issues that had been ignored for too long. More recently he has given many lectures on science and Christianity issues on college and university campuses in the United States, Canada, and England, sponsored by The American Scientific Affiliation and The Templeton Foundation. His professional interests turned also to both scholarly and popular writing in this field. He published two additional books and many articles, and served as the coordinator of

the 1984-85 Creation and Cosmogony research team of the Calvin Center for Christian Scholarship.

Since 1992 he has been a member of the Advisory Board for the Humility Theology Information Center (an initiation of the John Templeton Foundation), and has served as a member of the

Center of Theological Inquiry Advisory Committee (Princeton, NJ). Although retiring from Calvin College, Howard plans to continue his active program of speaking and writing on issues of science and Christianity and to continue his involvement with these other organizations. We in the Physics Department thank Howard for his many contributions to the department and college and wish him God's continued blessings on this new phase of his career.



Howard's retirement, along with Al Kromminga's retirement and John Van Zytveld's leaving which were reported in last year's newsletter, and the upcoming retirement of Roger Griffioen at the end of this year, will complete the transition in the department from the "old guard" to the new.

### LARRY MOLNAR JOINS FACULTY

Last year the department conducted a search for a tenure-track position to replace Howard Van Till. We had many outstanding applications, and we are very pleased to report that Dr. Larry Molnar has joined us this fall. Larry has excellent academic credentials, a clear love for teaching, and a deep Christian commitment that we think will make him an excellent addition to our department.

Larry is an astronomer by education and practice, having received undergraduate and graduate degrees in astronomy at Michigan and Harvard, respectively. Larry postdoc'd at the Harvard-Smithsonian Center for Astrophysics, and most recently has been an Assistant Professor at the University of Iowa. He also spent a

year in Germany. His research interests relate to radio interferometry and to the dynamics of disks and of few-body systems. Specific projects include studying Saturn's rings and radio emissions from Saturn's atmosphere. Some of his and a collaborator's recent work regarding passage of stars near the Oort Comet Cloud and the corresponding implications for triggering a comet shower earned him mention last winter in Science News.

Bringing Larry on board will increase the place of astronomy in the department, particularly when Debbie Haarsma arrives on campus next year. Our department has long been recognized as noteworthy among Christian Physics Departments; Larry and Debbie should help us be noteworthy as a Christian presence in astronomy as well. Larry has already had an



effect here—student Jon Niehof spent a week in June in Socorro, New Mexico at a workshop on radio imaging techniques, in preparation for a summer of research with Larry next summer.

### LEWIS REYNOLDS JOINS DEPARTMENT FOR 98-99

David Van Baak's departure for 1998-99 on a Fulbright (see below) created the need for a replacement, and the department is very happy that Lewis Reynolds ('93) is able to meet that need.

Following his graduation from Calvin with majors in physics and chemistry, Lewis pursued studies in physical chemistry at Penn State



University. We are very pleased that Lewis is able to join us, and look forward to a productive year.

## HERE'S SOME NEWS OF CONTINUING STAFF

**Roger Griffioen ('56)** was back in Tucson, Arizona for three weeks in January 1998, working again as a program officer for Research Corporation. He plans to join Al Kromminga and Howard Van Till in retirement at the end of the coming academic year (1998-99).

In the summer of 1997 **Stan Haan ('77)** received a three-year renewal of his NSF grant for continued theoretical work in photoionization and photorecombination of atoms. In the summer of 1998 Mike Dekker worked with him. This project has been very successful over the years, producing 17 papers in the past 10 years, 7 of the papers with student coauthors, and featuring 12 different students. His "work" took him to Prague in summer of 1997 and Berlin in 1998. Haan is presently juggling his research with chairman's responsibilities, which has also cut down considerably on his fish-

ing. He also maintains a serious interest in elementary school science, and has been working with Jim Jadrich in preparing Calvin elementary education students for teaching science.

**Jim Jadrich** has returned from his year (96-97) in Australia to again take up his duties in science education and physics. Jim and Stan Haan have a paper in press with the Journal of College Science Teaching which describes the interdisciplinary science course which they started at Calvin for elementary education students. In the meantime, Jim has begun work on the sequel to the course which explores the teaching of the process of science to these same students. In the areas of teacher education, Jim has helped to forge an alliance with Calvin, the Grand Rapids Children's Museum, and local schools in an effort to use the resources of all three institutions in teacher and student training in science. He will be

working on another alliance to tie Calvin in with the Grand Rapids Public Schools and Christian schools in servicing pre-service and in-service science teachers.

**Steve Steenwyk ('74)** was granted tenure last spring. He continues his collaboration with Michigan State University professors W. P. Pratt and J. Bass in the area of giant magnetoresistance in thin metal multilayers. A Calvin Research Fellowship has allowed Steve to continue this work during the academic year, focusing on the transport of spin polarized electrons through thin layers of niobium. He was again awarded a position as an Academic Affiliate with the Center for Fundamental Materials Research at MSU for the summer of 1998 to continue with related studies in tungsten and other metals.

From teaching astronomy Steve has expanded his audience, giving a multimedia presentation entitled "Comets, the Swords of Heaven" at various campus and church venues. He also enjoys putting on children's science demonstrations.


**Steve Platt ('91)** joined us in full-time capacity in December of 1997 as our Laboratory Services Coordinator. Steve has a masters in physics from Michigan State. Steve is in charge of lab equipment and of the core area. He has considerable mechanical savvy that has proven very helpful in getting demonstrations and labs working right. He's organizing the equipment storage area, and he's started some long-overdue projects such as cleaning and repairing our telescope. He also taught a couple labs during the spring semester, and will continue to teach some labs in coming years. Steve has already established himself as an important part of the department.

**David Van Baak ('73)** had speaking engagements this year ranging from "Variational alternatives to Kirchhoff's

second law in d.c. circuits" at the Michigan section of the AAPT, to "Can Science Survive in a Post-modern World" at Calvin's 'January Series' during interim 1998. A return visit, in June, by 1996 sabbatical visitor Kameshwar Razdan of the University of Wisconsin—Stevens Point enabled the completion of a paper "Demonstrating optical saturation and velocity selection in rubidium vapor", and work with junior student David Tong enabled the completion of a long-term apparatus-development project, with the measurement of the magnetic susceptibility of a Curie paramagnet over the full temperature range 10 - 300 K. These days the Van Baak family is abroad, as David spends the '98-99 academic year in lecturing and research at University College Cork, a campus of the National University of Ireland in Cork, (Republic of) Ireland, supported by a Fulbright Fellowship.

**Matt Walhout ('88)** is now beginning his third year at Calvin, and is making his mark in the department and college. In addition to his work with atom trap-

ping described above, Matt has begun a secondary research project that focuses on some novel properties and potential applications of dielectric-barrier discharges in noble gases. These a.c. high-voltage discharges can be used to generate high levels of radical chemical species and ultraviolet excimer radiation. Calvin junior Jonathan Niehof worked on this project over the past summer under a student assistantship from Calvin College. In July Matt was co-participant along with his father in a Summer Seminar that was led by Sir John Polkinghorne on "Theology and the New Physics," and he has been appointed to replace David Van Baak this year on the college committee that is studying and preparing revisions in the college core curriculum.

**Jeff Wolinski** will remain at Calvin through the 1998-99 school year, but he has accepted a position at Houghton College (NY) beginning in Fall of 1999. Jeff, a particle physicist by training, has spent much of the summer putting together laboratory equipment for investigating sonoluminescence. 

## NEWS FROM DEPARTMENT ALUMNI

Several alumni have had children at Calvin this past year, and some of them stopped at times to visit the department. Those we know about include:

**Rick Shoemaker '66**  
**Bruce Geelhood '69**  
**Al Koop '69**  
**Matt Vander Hill '69**  
**Bob Hollebeek '70**  
**Tom Ackerman '70**  
**Stuart Rupke '71**  
**David Snoek '72**  
**Steve Steenwyk '74**  
**Bob Selles '76**

Also former faculty member **John Lillis** had a son at Calvin.

**John Buttery '68** is involved in real estate in Kalamazoo, MI and is very involved in the local Christian School, according to one of his college classmates.

**Bill Friesema '71** is living in the Chicago area and is writing scheduling

software for the railroads.

**Bob Selles '76** has been teaching at Manhattan, Montana Christian High School since he graduated.

**Joe VanAndel '78** and his wife did the Ride the Rockies bike tour again last summer. The route covers more than 350 miles in six days, and goes above an elevation of 12,000 feet.

**Keith Griffioen '79**, associate professor of physics at the College of William and Mary in Williamsburg, VA, has received the Society of the Alumni's Alumni Fellowship Award, which recognizes younger faculty members whose classroom work has already achieved notoriety among students, colleagues and staff.

**Pam Naber Knox '80** resigned her position as Wisconsin State Climatologist so that her husband John could take a tenure track position at Valparaiso University in atmospheric science (geography). She will be teaching physics labs there part-time. **Bob**

**Manweiler**, former Calvin physics faculty, is also at Valparaiso in physics.

**Jonathan Seerveld '83** moved to Hawaii in 1993 to work for the Canada-France-Hawaii Telescope Corporation in their optics and instrumentation group. Last year he and his wife Cindy adopted a second child.

**Wm. Harry Plantinga '83** has accepted a position in the new Department of Computer Science at Calvin, effective September 1999.

**Dave Cole '85** is completing his PhD in Astronomy at the University of Chicago, and has accepted a postdoctoral position at the Jet Propulsion Laboratory in California.

**Andy Kalt '89** is now pursuing music full-time and produced his first CD, "Paddling Upstream", in December, 1997.

**Philip Polstra '90** is Director of Architecture for Sapien Corporation, a computer consulting firm in Atlanta, GA.

**Harold Schnyders '91** received his PhD degree from Michigan State University, doing his research in John Van Zytveld's lab, and is presently in a postdoctoral position at Argonne National Laboratory.

**David Streutker '97** has finished his first year of graduate classes at Rice University.

**Ed Hamilton '97** finished his first year of graduate school at the University of Colorado-Boulder and worked this summer in Chris Greene's group at JILA.

**Bill Zeilstra '78** stopped by during Synod 1998. He retains interest in Astronomy while a CRC pastor in Pella, Iowa. He spent a week in August 1998 as a volunteer at the world's highest operating observatory—at an altitude of 14,148 feet on Mt. Evans, near Denver. He reports the experience to be a dream come true.



## CONCLUDING COMMENTS FROM THE CHAIR

The department is healthy and vibrant. The newer faculty members are outstanding scholars who are making a positive impact in the department and in the college. The amount of research and other professional activity besides teaching continues to grow, but always with the clear understanding that our goal is to provide the best Christian undergraduate education that we can—not only for our majors, but for all students taking physics and astronomy courses. The Christian character of the college allows us to attract faculty members who could be at more “prestigious” institutions, but who choose to come to Calvin because of their commitment to quality, Christian education.

The greatest challenge facing the department is the need for more physics majors. Consequently, we are looking for ways to improve recruitment, and we always welcome suggestions you may

have or names of prospective students. We are also making a conscious effort to attract students who might want careers as “hyphenated physicists” or who might want to use a physics major to complement another major. We've revised our major slightly with regard to minimum requirements in the hope that we can attract more of the latter group into physics majors. For example, some liberal arts colleges have instituted “five-year programs” with Engineering schools that lead to two degrees. At Calvin it is now possible for most students to get two degrees—a Bachelor of Science in Engineering and a Bachelor of Arts in Physics—in four years plus a summer. We don't need a lot of physics majors—indeed one of the strengths of the department is the amount of interaction between students and faculty that naturally occurs when student numbers are small—but right now our physics major represents an under-used resource!

*S.L.Haan* 

*Grand Rapids, MI 49546-4388*

*3201 Burton Street S.E.*

*Department of Physics and Astronomy*

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