

"All the v's

That's fit to Print"

PHYAST FLYER

The Department of Physics & Astronomy

The University of Oklahoma

Volume 7, Number 1 · Fall 1998 · Dick Henry, Editor · Danette Miller, Production

Website: <http://www.nhn.ou.edu>

WELCOME ERIC ABRAHAM

The Department has a new atomic physicist, Eric Abraham, who began teaching classes at OU this fall. Eric, originally from South Dakota, received his B.A. in Physics and Mathematics from St. Olaf College in 1991, and his doctoral degree was obtained at Rice University in 1996, where he completed a dissertation on "Photoassociative Spectroscopy Of Collisions Between Ultracold Lithium Atoms", under Dr. Randy Hulet. Before joining us Eric was a postdoc at JILA in Boulder, where he worked with Eric Cornell, Carl Wieman, and Dana Anderson. Eric was an avid debater in high school and college, and even coached debate at Rice while a graduate student. His principal hobby right now is chess. Eric's wife Jane, also a graduate of St. Olaf, has a masters degree in Public Administration from the University of Houston, although her primary duties include administering to son Ryan, 3 years old. We in the Physics & Astronomy Department are very happy to have Eric here and wish him the best of luck!

AWARDS



Again last spring our Department received more than its share of honors for its teaching and research efforts. Six faculty (including three assistant professors) and one graduate student were honored with a total of eight awards. They are:

Kieran Mullen: Irene Rothbaum Award for Outstanding Assistant Professor in the College of Arts and Sciences

John Cowan: S.R. Noble Foundation Presidential Professor

John Furneaux: Regents' Award for Superior Research and Creative Activity

Neil Shafer-Ray: Junior Faculty Research Program

Mike Strauss: Junior Faculty Research Program

Kazuhito Hatano: Outstanding Graduate Research Assistant and Outstanding Graduate Assistant

Stu Ryan: UOSA Professor of the Year

We congratulate this group of individuals for continuing the Department award-gathering tradition.

NIELSEN RENOVATION UNDERWAY



The stately sycamore tree and the loading dock are gone on Nielsen Hall's west side, and construction has begun on Phase I of the Nielsen Hall renovation. Set to be completed for classes in spring, 2000, the Department's home building will sport two new lecture halls housed in a multi-story extension. The second floor hall will seat 305, while the one on the first floor will accommodate 220 students. Both the shop and the demonstration equipment room will be extended to the south. Two additional phases planned for the future include the building of a new wing to the south and a reconfiguring of the current building to render more office space for faculty and graduate students, as well as new teaching labs. These plans have lately been given additional impetus by an extremely favorable external review report which recommended, among other things, that OU place high priority on funding Phases 2 and 3.

Perhaps less dramatic but more nostalgic is the current effort to decorate the Nielsen hallways with nicely framed black and white photographic prints of persons and equipment connected with the Department over the decades. This summer nine such pictures were hung on the walls along the first and second floors with 10 more soon to come. Highlights include a photo taken at a Department picnic in the 30's, the original of which was sent to us by an alumnus, a picture of Dr. Nielsen with Nobel Laureate Robert Millikan during the latter's visit to OU, and several of Niels Bohr during his two OU visits in the 30's and 50's. The framing style was chosen to match that being used for numerous pictures of OU historical note being hung in many buildings around campus.

ALUMNI NEWS

Ray Mires (PHYS PHD 1964) of Lubbock, TX, has been retired from the faculty at Texas Tech since 1991 and has been doing consulting work since then, mostly in the area of Forensic Physics. He is also past Chairman of the Engineering Sciences Section of the American Academy of Forensic Sciences. Raymond was a student of Chun Lin and looks forward to attending the symposium in Dr. Lin's honor in 2000.

Eldon Ferguson (PHYS PHD 1953), a student of J.R. Nielsen, was awarded the Erwin Schrodinger Gold Medal at the 10th biennial meeting of the Symposium on Atomic and Surface Physics, held in January in Austria. He also hopes to make the Lin Symposium in 2000.

Deborah Briscoe Graves (ASTR MS 1987) is a Software Engineer at LTX Corp. in San Jose, CA. She helps design and build testers for the semiconductor industry, currently specializing in timing and calibration. Last year Deborah added an electronics engineering degree to her credentials. Deborah can be reached at deborah_graves@ltx.com.

MORE NEW FACES AT NIELSEN

We are happy to welcome many new people to the Physics & Astronomy Department this Fall. First, Eric Abraham is our new Assistant Professor in Atomic and Molecular Physics. (See the column on Eric elsewhere in this newsletter.) In addition, we welcome seven new graduate students: Varuni Seneviratne, Amber Longstreet, Max Knowlton, Fred McKenna, Dan Petersen, Kate McDonald, and Jean Claude Chokomakoua. Rusty Boyd joins our staff as an electrical engineer, while Ethan Lamkin and Chris Gehant have begun working in the computer lab.



NEW PhD's

The past year has seen a large number of graduate students finish up their dissertations and leave the Department. In alphabetical order (major, advisor) they are: Jim Buell (Astro, Henry), Debra Burris (Astro, Cowan), Kushlani Dharmasena (AMC, O'Halloran), Kenneth Eack (Weather Physics, Beasley), Kory Goldammer (App. Physics, Santos), Joe Howard (Astro, Henry), and Tad Thurston (Astro, Henry). In addition, Francesca Boffi, a former MS student in Astronomy at OU has recently been awarded her PhD from the University of Milan and is working at the Space Telescope Science Institute in Baltimore. We are happy to note that with the exception of Kushlani, who is taking time to enjoy her new baby, all of the above are employed in work directly related to their degree training.

DEPARTMENT PRODUCTIVITY

Two department additions should be noted. First, Danette Miller, secretary extraordinaire, gave birth to Aaron Richard Loyd on June 26. Weighing in at 9lb. 1 1/2oz, little Aaron and his mom spent a couple of months becoming acquainted while the workload in the office was handled admirably by Linda, Grettie, and temporary people. Danette is now back hard at work.

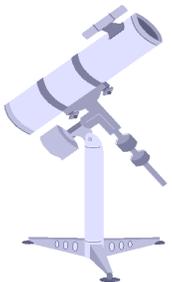
Another spring arrival came on May 22 when post doc Kushlani Dharmasena's baby girl was born.

NEWS FROM THE FRONT OFFICE

Grettie Bondy captured the position of Secretary/Treasurer of the Hourly Employees Council during spring elections. Only a few hours after being declared the winner, and in a dramatic finger-wagging denial before TV cameras, Bondy countered speculation that she had used her office phone to solicit soft money funds for her campaign. Uh-huh.

VAN DE GRAAFF OBITUARY

Last July the removal of the 7 Ton van de Graaff from the basement of Nielsen marked the changing of eras in Physics and Astronomy. The accelerator itself dates back to 1964 but it was "rescued" from the University of Kansas by Stu Ryan in the late 70's and set up by Helmut Fischbeck in the basement of Nielsen early in the 80's. Under the supervision of Helmut and Stu this instrument ran for nearly fifteen years. Many students (both grad. and undergrad.) performed RBS and PIXIE experiments on this instrument for their thesis research. (Possibly the most notable was forensic experiments that resulted in the near-conviction of an east coast Mafia boss.) The accelerator will find new life at Element Analysis Corp. (EAC) of Lexington, KY (associated with the University of Kentucky). EAC provides elemental analysis of a wide variety of samples with a 24-hour turn around time. They perform this service for many of the Fortune 500 companies. The old van de Graaf will be one of two accelerators at EAC. The lab space opened up by the van de Graaf's removal will also have a new life: it will house a modular cleanroom for semiconductor processing as well as semiconductor characterization instruments. This will provide much needed fabrication and characterization tools for various groups within the Laboratory of Electronic Properties of Materials (LEPM) here at OU. (Matt Johnson)



FALL ASTRONOMY LECTURES/OBSERVING OPENHOUSES

The Friday Night At The Observatory public program is beginning its seventh year this fall with three speakers scheduled. Speakers, dates, and titles are: Bruce Twarog (P&A, KU), 9/18, "The Universe At The Speed Of Light"; John Cowan (P&A OU), 10/23, "How Old Is The Universe"; and Jackie Milingo (P&A, OU), 11/20, "Planetary Nebulae: Adventures Of A Dying Sun". All lectures begin at 7:30pm in 128 Dale Hall and are followed by a trip to the OU Observatory, weather and equipment operation permitting. For more information, contact Dick Henry at 405-325-3961 x36222.

SPECTACULAR SENIORS

We had 11 students take the Major Field Achievement Test, intended for graduating seniors. While our students have always done well on this exam, always ranking in the top half of all students, this year our students performed at a truly exceptional level.

The mean score of all of the students taking the test placed the Department of Physics and Astronomy at the 93rd percentile for all institutions and students nationally who took the exams!

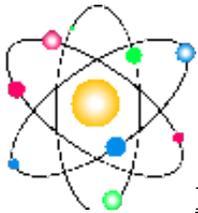
This is significantly better than the students taking the test the previous year. The average department score was up by almost 10 points and the national percentile ranking increased by 26 percentage points. This is by far the best performance of any of our graduating classes.

The results of the individual Assessment Indicator Tests also indicated that the program does an equally good job in teaching all areas of physics. The tests covered the following areas: 1. Classical/Lagrangian/Hamiltonian Mechanics, 2. Fundamentals of Electromagnetism, 3. Atomic Physics & Quantum Mechanics, 4. Thermodynamics/Statistical Mechanics/Physical Optics/Waves and 5. Special Relativity/Laboratory Methods/Solid State Physics/Nuclear and Particle Physics. The scores of the students were comparable in all tested areas indicating no deficiencies or gaps in any tested subjects. Even more important, the students again demonstrated a commanding knowledge of all of the tested subjects. In comparison to all other students nationally who took these Assessment Indicator Tests our students averaged from a low of 88% to 98% on the five exams! Furthermore, the students taking the test this year improved in all areas tested by an average of more than 10 percentage points over students from the previous

year. (John Cowan)

LIN SYMPOSIUM 2000

The symposium in honor of former OU Physics Professor Chun Lin is currently being planned for May or June of 2000. Right now organizers are envisioning two full days of talks capped off with a banquet. Judging by letters sent to the Editor of this newsletter, there is a high level of interest in the symposium. We are hoping that large numbers of Department alumni and friends of Professor Lin will attend. As plans develop they will be related in the newsletter and other mailings.



DEPARTMENTAL RESEARCH ACTIVITIES

Publications:

C. M. Bender and K. A. Milton, "Model of Supersymmetric Quantum Field Theory with Broken Parity Symmetry," Phys. Rev. D 57, 3595 (1998);

K. A. Milton and O. P. Solovtsova, "Analytic Perturbation Theory: A New Approach to the Analytic Continuation of the Strong Coupling Constant α_S into the Timelike Region," Phys. Rev. D 57, 5402 (1998);

K. A. Milton and Y. J. Ng, "Observability of the Bulk Casimir Effect: Can the Dynamical Casimir Effect be Relevant to Sonoluminescence?" Phys. Rev. E 57, 5504 (1998).

K. Hatano, D. Branch, and J. Deaton, "Extinction and the Radial Distribution of Supernovae in Their Parent Galaxies", Astrophys. J., 502, 177 (1998)"MBE growth of PbEuSe on CaF₂/Si (111)", X.M. Fang, I-Na Chao, B.N. Strecker, P.J. McCann, Shu Yuan, W.K. Liu, and M.B. Santos, Proceedings of the 8th International Conference on Narrow Gap Semiconductors, edited by S.C. Shen, D.Y. Tang, G.Z. Zheng, and G. Bauer, (World Scientific, 1998), 101.

"Electrical properties of InSb quantum wells remotely-doped with S", K.J. Goldammer, W.K. Liu, G.A. Khodaparast, S.C. Lindstrom, M.B. Johnson, R.E. Doezema, and M.B. Santos, Journal of Vacuum Science and Technology B16, 1367 (1998).

"Molecular beam epitaxial growth of Bi₂Se₃- and Tl₂Se-doped PbSe and PbEuSe on CaF₂/Si(111)", X.M. Fang, I-Na Chao, B.N. Strecker, P.J. McCann, S. Yuan, W.K. Liu, and M.B. Santos, Journal of Vacuum Science and Technology B16, 1459 (1998).

"Surface segregation and compensation of Si in delta-doped InSb and AlInSb grown by molecular beam epitaxy", W.K. Liu, K.J. Goldammer, and M.B. Santos, Journal of Applied Physics 84, 205 (1998).

"Observation of excitonic transitions in InSb quantum wells", N. Dai, F. Brown, P. Barsic, G.A. Khodaparast, R.E. Doezema, M.B. Johnson, S.J. Chung, K.J. Goldammer, and M.B. Santos, Applied Physics Letters 73, 1101 (1998).

"Observation of excitonic transitions in InSb quantum wells", N. Dai, F. Brown, P. Barsic, G.A. Khodaparast, R.E. Doezema, M.B. Johnson, S.J.

Chung, K.J. Goldammer, and M.B. Santos, *Applied Physics Letters*, vol. 73, p. 1101 (1998).

P. H. Hauschildt, F. Allard, D. Alexander, and E. Baron, "Model Atmospheres for M Dwarfs and Giants: II. NLTE Effects for Ti I", *Ap. J.*, (1997), 488, 428--442.

P. H. Hauschildt, S. Shore, G. Schwarz, E. Baron, S. Starrfield, and F. Allard, "Detailed NLTE Model Atmospheres for Novae During Outburst: I. New Theoretical Results", *ApJ*, (1997), 490, 803--818.

E. Baron and P. H. Hauschildt "Parallel Implementation of the PHOENIX Generalized Stellar Atmosphere Program II: Wavelength Parallelization", *Ap. J.*, (1998), 495, 370--376.

"Anisotropic transport of quantum Hall meron-pair excitations", K. Moon and K. Mullen, *Phys. Rev. B* 57, 1378 (1998).

"Accurate effective action for quantum Hall skyrmions" K. Moon and K. Mullen, *Physical Review B* 57, 14,833 (1998).

Phil Gutierrez and D0 Collaborators: "Limits on $WW\gamma$ and WWZ couplings from W boson pair production"; "Direct measurement of the top quark mass by the D0 Collaboration"; "Determination of the mass of the W boson using the D0 detector at the Fermilab Tevatron"; all in *Phys. Rev. D* Vol. 58; "Search for Heavy Pointlike Dirac Monopoles", *Phys. Rev. Let.*, volume 81 Issue 3; "Search for Charge-1/3 Third-Generation Leptoquarks in proton antiproton collisions at $\sqrt{s} = 1.8$ TeV", *Phys. Rev. Let.*, volume 81, Issue 1; and "Measurement of the Shape of the Transverse Momentum Distribution of W Bosons in proton antiproton collisions at $\sqrt{s} = 1.8$ TeV", *Phys. Rev. Let.*, vol. 80, Issue 25.

R.B.C. Henry, "Abundance Profiles in Disk Galaxies from Nebulae", *Astron. Soc. Pac. Conf Ser.*, 147, Abundance Profiles: Diagnostic Tools For Galaxy History, D. Friedli, M. Edmunds, C. Robert, & L. Drissen, eds., p.59 (1998).

R.B.C. Henry, K.B. Kwitter, & J. Buell, "Planetary Nebula Abundances, Stellar Yields, and the Galactic Evolution of C-12 and N-14", Rev. Mexicana Astron. Astrof. Conf., 7, 6th TexMex Conference on Astrophysics, R. Dufour & S. Torres-Peimbert, eds, p.30 (1998).

MEETINGS:

The recent DAMOP meeting (Division of Atomic, Molecular and Optical Physics) in Santa Fe N.M. May 27-30, was attended by several faculty members and graduate students, including Mike Morrison, Deborah Watson, Eric Abraham, Olen Boydston, Brett McKinney, John Carzoli, Stefane Marzban. Recent Nobel Laureates William Phillips and Steven Chu gave plenary talks on the last morning of the meeting.

Georg Steinbrueck: APS 1998, April 18-21, 1998, Columbus, Ohio, title of talk: Method for measurement of the angular distribution of electrons from W Bosons, talk given by Georg Steinbrueck for the D0 collaboration. Georg also attended two days of the July 1998 workshop of the D0-collaboration held at Fermilab.

Kim Milton: 17th Symposium on Theoretical Physics---Applied Field Theory, Seoul National University, Seoul, Korea, June 29-July 1, 1998, one of two invited lecturers outside of Korea. Kim gave two 2-hour lectures on "Casimir effect and related topics." Also, XXIX International Conference on High Energy Physics (ICHEP'98), Vancouver, BC, July 23-29, 1998. Kim was selected to give a talk on "Analytic Perturbative Approach to QCD."

Kory Goldammer, Seokjae Chung, and Mike Santos gave talks at the American Physical Society March Meeting.

In June, Mike Santos presented a poster on InSb quantum wells at the Advanced Research Workshop on Future Trends in Microelectronics (Ile des Embiez, France).

In September, Kory Goldammer presented a poster, entitled "High-mobility electron systems in remotely-doped InSb quantum wells," at the Tenth International Conference on Molecular Beam Epitaxy (Cannes, France).

Kieran Mullen: Attended the Institute for Theoretical Physics, UCSB, Conference on Disorder and Interactions in Quantum Hall and Mesoscopic Systems August 9-13, 1998

Deborah Watson attended Alex Dalgarno's 70th birthday symposium in Windsor Park outside London in July.

TALKS:

Heidi Morris: "Principal Component Analysis Applied to an Investigation of Volcanic and Seasonal Aerosol Fluctuations as Observed from Flagstaff, Arizona, 1980-1992". Seminar given 19 August 1998 at Los Alamos National Laboratory.

Mark Keil: "Initial and Final State Dependence of Angular Distributions for the F+H₂ Reaction", by M. Keil, G. Dharmasena, T.R. Phillips, S. Crocchianti, and G.A. Parker, was presented by Mark Keil as an invited talk to the Gordon Conference on Atomic and Molecular Interactions held at Colby-Sawyer College in New Hampshire, June 28-July 3, 1998.

Kim Milton: "Nonperturbative Calculation of Symmetry Breaking," Seminar, OU 3/5/98; UCLA 3/16/98.

Mike Santos: "Fabrication and Electronic Properties of InSb Quantum Wells", University of Arkansas, Department of Physics, Fayetteville, Arkansas (4/3/98); and Blaise Pascal University, Laboratory of Science and Materials for Electronics and of Robotics, Clermont-Ferrand, France (6/8/98).

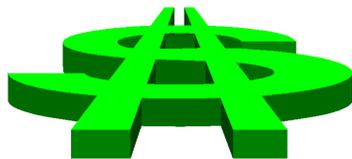
Ed Baron: "Searching for the Progenitors of Type Ia Supernovae", Supernova Workshop, ITP, Santa Barbara, Sept. 1997; University of Georgia Athens, GA, Oct. 1997; and Southern Methodist University Dallas, TX, Feb. 1998.

Kieran Mullen: "Topological Excitations", University of Arkansas, May 1998.

John Cowan: "r-Process Signatures in Stars" at the American Physical Society Meeting in April (Columbus, OH) and University of Texas at Austin (in March).

Dick Henry: "Abundance Profiles in Disks from Nebulae", colloquium, presented to the Department of Astronomy and Space Science, Rice University, April 21, 1998.

Dick Henry: "Galactic Ecology: The Impact of Solar Type Stars on the Evolution of the Milky Way Galaxy", colloquium presented to the Department of Physics, Austin College, April 7, 1998.



GRANTS:

US Department of Energy, K. A. Milton, "Nonperturbative Quantum Field Theory," \$90,000.

NSF Division of Electrical and Communications Systems, M.B. Santos , "CAREER: Electronic Device Applications for InSb-Based

Heterostructures," \$200,000 for four years.

Oklahoma State Regents for Higher Education, R.E. Doezema, J.E. Furneaux, M.B. Johnson, M. Keil, B. Mason, K. Mullen, S. Murphy, and M.B. Santos, "Research and Education Opportunities in Semiconductors," \$240,000 for one year.

NSF, "Detailed Modeling of Radiation Transport in Supernovae" E. Baron and P. Hauschildt (UGA) \$53,656

NASA, "Multi-wavelength Studies of Supernovae" E. Baron, D. Branch and P. H. Hauschildt (UGA) \$50,000

Phil Gutierrez: Funded through the Fermilab D0 experiment, Phillip G., M. Strauss, G. Kalbfleisch, "Memorandum of Understanding between OU and Fermilab---Production Testing of Silicon Micro-Strip Detectors for the D0 experiment at Fermilab" \$15,000'

Dick Henry: "Nebular Chemical Abundances From ISO Infrared Data", NASA (Infrared Space Observatory), \$5,000.

TRAVEL:

Kim Milton made two trips to UCLA, one in March, and one in July, primarily to do research in the University Archives where all of Julian Schwinger's papers are kept. This was for his forthcoming scientific biography of Schwinger.

Ed Baron: Oct. 1997, UGA to visit Peter Hauschildt, worked on further parallelizing our calculations. Feb. 1998: SMU to work with Vic Teplitz on neutrinos in supernovae.

John Cowan: Two trips to the University of Texas, Austin to work with Chris Sneden; one to Harvard University to work with Al Cameron; and one to the University of Chicago to work with Jim Truran; and one to Switzerland (University of Basel) to work with Friedel Thielemann.

Dick Henry traveled to Rice University in April to work with Reggie Dufour and to Williams College in July to work with Karen Kwitter. Also, he spent three nights in May at the Apache Point Observatory (dangerously close to Roswell, NM) observing with collaborators Karen Kwitter (Williams College) and Bruce Balick (U. of Washington).

Mike Morrison went to Australia during June to work with research collaborators.

John Furneaux spent a sabbatical year in Uppsala, Sweden.

OU VISITORS:

Kim Milton, host: Igor Solovtsov and Olga Solovtsova visited for six months, November 20, 1997 through May 19, 1998. They worked on analytic perturbation theory applied to QCD processes. Carl Bender visited for a week in January, when he and Kim worked on a new class of theories, which apparently violate unitarity, but respect PT symmetry. "Very wild but exciting stuff!" says Kim.

Mike Santos, host: Philippe Debray from Saclay (France) visited Mike Santos in June to discuss the fabrication of mesoscopic devices made from InSb quantum well structures.

Ed Baron, host: Apr. 1998--Peter Hauschildt, worked on including non-monotonic velocity flows in our calculations.

BREAKTHROUGHS (or exciting developments):

Kim Milton: "Analytic Perturbation Theory--Ordinary perturbation theory becomes useless in QCD at small momentum scales, because the usual renormalization group resummation leads to unphysical singularities, the famous Landau pole, for example. We have a method of enforcing the correct analytic properties, which are required by causality. The technique turns out to have unexpected bonuses: Higher perturbative corrections are small, so low order perturbation theory is reliable, and even more remarkably, there is practically no renormalization scheme dependence, which renders the usual approach useless for momentum transfers below 3 GeV. PT symmetric theories--this is an unconventional tack, in which we violate parity, and Hermiticity (unitarity); yet, because of PT symmetry, we can preserve the reality of the spectrum of a quantum system. We have written a paper in which we show that this version of electrodynamics possesses a perturbatively stable nontrivial fixed point. Monopoles--In the Spring came a report from Fermilab quoting a limit on the masses of magnetic monopoles based on virtual monopole production of high-transverse momentum photons. Gamberg, Kalbfleisch, and I criticized this work on the basis of the totally unreliable theory underlying this analysis, and concluded that a direct search, such as we are attempting in the basement, is undoubtedly much more reliable."

TEACHING NEWS

Interesting quote from a student of John Walkup in Phys 2524. "We're not as motivated and intelligent as you are used to."

Kim Milton's big news is that Classical Electrodynamics is available at your favorite bookseller. In case you wish to order extra copies (they make wonderful Christmas or Hanukkah presents!) here are the publication details: J. Schwinger, L. L. DeRaad, Jr., K. A. Milton, and W.-y. Tsai, Classical Electrodynamics, Advanced Book Program, Perseus Book, ISBN: 0-7382-0056-5.

Ed Baron is having the students give the lectures in his graduate Stellar Atmospheres class.

Kieran Mullen is starting a TA training seminar for helping TA's with teaching. While the University has its own training seminar, our Department has begun its own in order to address the specific problems of teaching labs and discussions in Physics & Astronomy.

GRADUATE STUDENT NEWS

Heidi Morris will spend the next two years completing her dissertation at Los Alamos National Laboratory.



SUMMER ACTIVITIES

Ed Baron: Another summer with 7 REU students. They learned a lot and did enough work to trade for a permanent IDL license, which is worth

more than they were paid.

WHO ARE THEY?

The following are brief descriptions of physicists of the past. Identify them all correctly and receive a free one-year subscription to the *Phyast Phlyer*. Send your answers to the Editor by post or email (henry@nhn.ou.edu). Winners will be announced in the winter newsletter.

1. This British physicist was born in Ireland in 1819 and is mainly remembered for developing a law which relates the force moving a body through a fluid to the velocity and size of the body and the viscosity of the fluid.
2. This physicist discovered that an electric current produces a magnetic field.
3. This son of a marine biologist was born in Boston. His scientific work was confined to the spectroscopy of the extreme UV region.
4. Born in 1822, this German physicist is credited with originating the second law of thermodynamics.

SCRATCHPAD

For those readers who engage in the contemplative sport of worrying about the nature of scientific knowledge, [Consilience: The Unity of](#)

Knowledge is a book certain to liven up your fall reading list. This work by well-known Harvard sociobiologist E.O. Wilson is an attempt to resurrect the driving spirit of the Enlightenment period, which held that all is explainable by science. Wilson's thesis is that scientific law does not end where art, music, and literature begin. Instead, he maintains that these "separate" pursuits of the humanities, highlighted in the 1959 lecture by C.P. Snow on two cultures (those who understand the 2nd law of thermodynamics and those who don't), are ultimately understandable through principles now under development in human genetics. These uniquely human endeavors, according to Wilson, will be seen as extensions of the human organism, and especially the intellect. Thus, there is no separation between science and the humanities. In advocating his ideas, Wilson recommends tearing down the academic walls which divide the narrow scientific disciplines from one another, as well as getting rid of the academic impediments standing between scientists and scholars in the humanities and social sciences. (What fool will want to chair this reconfigured department?) Rather, all knowledge is part of a continuum, something that is understandable through the scientific processes of deconstruction and reconstruction, and thus eventually the emotional nuances in Beethoven's Ninth Symphony will be tied to scientific law. These arguments are sure to annoy some post-modernist (Wilson's term) types in the humanities and the political world attempting to discredit Western science by characterizing it as merely the intellectual outflow from a group (mostly male) sharing a common cultural background, i.e. that scientific knowledge is culture-based in a world lacking objective reality. No matter your feelings on these issues, Wilson's book provides a much-needed look at science, scientists, and the role of scientific knowledge in society. (Dick Henry)

