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Faculty File

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Stellar Progress

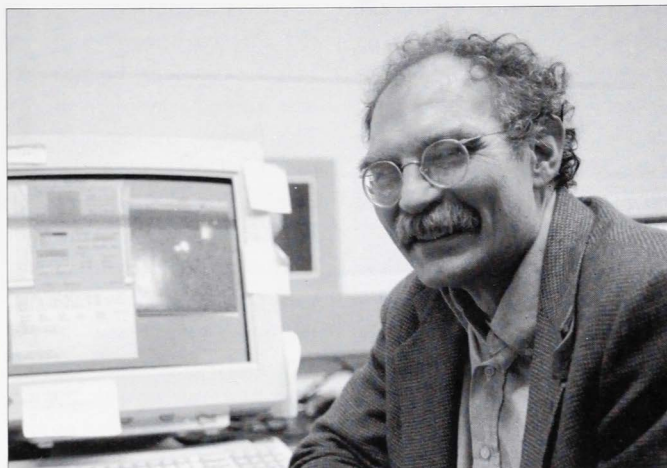
New astronomy classroom shelters Murray Campbell's unusual program

By Stephen B. Collins '74

Astrologers who believe that the alignment of heavenly bodies can have a beneficent influence on earthly affairs must see a spectacular line-up over Colby's astronomy program. Merrill Professor of Physics Murray Campbell waxes enthusiastic about the Collins Observatory ("it's not posh, but everything about it is research grade"), Colby's location for astronomical observations ("on a scale of one to ten it's a ten; the amount of scattered light is very small"), the commitment of student astronomers ("we have an unusually enthusiastic student body") and the new astronomy classroom that opened in January ("it was a dream").

Credit Campbell's own enthusiasm—and Yankee ingenuity—for a large measure of the program's success. Since arriving at Colby in 1980 he has built the small astronomy program a little at a time. The Physics and Astronomy Department has grown so that it now averages 12 to 15 majors each year—more than UConn, NYU, Syracuse, Penn, Brown or Columbia, not to mention most liberal arts colleges, according to department chair Robert Bluhm.

"The bottom is falling out of it [the number of physics majors nationwide] and we're totally bucking the trend," Campbell said. In March six students and four faculty members made presentations at the American Physical Society centennial meeting in Atlanta, Ga. Two of them, seniors Colleen Schwartz and Catherine Garland, presented poster displays from their astronomy honors



Murray Campbell has built the astronomy program a little at a time.

theses—Schwartz's "Mapping of the SiO Maser of the Orion BN/KL Region" and Garland's "Analysis of Narrowband Mid-Infrared Images of the UCH II Complex G434.26+0.15."

Garland said hearing Stephen Hawking's presentation, "The Universe in a Nutshell," was the highlight. "I had always hoped to but never dreamt that I would hear him speak," she said.

Campbell credited Bill Tiernan '77, then a department assistant at Colby and now a physics professor at Mesa State College in Colorado, for developing the Stars and Stellar Systems lab course 20 years ago. Today it is unique in Colby's catalogue because of the lab schedule: "Students must be available Monday through Thursday evenings for telescope observing as weather permits."

"On the first clear night I leave a message on my phone and say, 'We will have a lab tonight,' and they come," Campbell said. There are no make-ups, and usually all 30 to 45 students have their four observations completed by Columbus Day. "It could only work at a residential college," he said.

Colby received the Collins Observatory as a gift from Anthony Kramer '62 and had it installed between the baseball field and the Gould Music Shell in 1988. It was a good, manually operated telescope, Campbell says. He got a National Science Foundation (NSF) grant to automate it and turned it into a good teaching research telescope with computerized controls and a high-quality digital camera or Charged Coupled Device.

A heated bunker was built to keep the telescope's computers warm enough to function, but for years students and instructors were sheltered in the skaters' warming hut, which was moved to the site for the fall course.

Besides the fall course and lab, there is a Jan Plan titled Introduction to Astrophysics. While others may curse Maine's early winter sunsets, Campbell rejoices. January and February offer the most clear nights of any months, and "you can do a lab and still go home for an early supper," he said. That was cold comfort until this winter when a new (heated) astronomy class-

room became a permanent home for the program.

Inside the building, four groups of students are in charge of different functions and work together like a NASA mission-control team. "It's set up as a model of a mountaintop observatory," Campbell said. Students work on bright objects and open clusters of stars. In January, Orion is strategically high in the sky, and many students study its nebula. By taking three exposures and combining the images in the Schupf computational lab (using the same research software that the Hubble telescope uses) they can generate color photos of the Orion Nebula.

The Introduction to Astrophysics course was designed to incorporate research into learning and became one of the models for the \$500,000 NSF Award for the Integration of Research in Education (AIRE) grant received last year. Campbell credits its teaching assistant Mike Ramstrom's work in the astronomy and computational labs for helping attract the talented corps of student astronomers. Campbell can reel off the names of about a dozen current or recent students with impressive research fellowships and credentials, from the Harvard/Smithsonian Astrophysical Observatory in Massachusetts to Cal Tech and the University of Hawaii. It's all a tribute, he said, "to the flexibility and the cooperation that Colby offers, and to doing a little bit at a time" to build a modest-sized but excellent undergraduate astronomy program. ♦

Is It Soup Yet?


It sounds like the premise for a 1950s science fiction movie—professors manufacturing genetic material. In a Keyes laboratory, Dorros assistant professors of biochemistry Steve Dunham and Shari Ulrich Dunham are doing just that, “making” DNA.

Using a chemical synthesizer, the Dunhams combine small amounts of synthetic guanine, thymine, cytosine and adenine—the four bases that make up DNA. Students use these recipes to

observe how the different sequences change the structure of DNA and how those changes affect its function.

“Students get pure, homogeneous DNA to work with rather than having to extract the DNA from a cell, which can be difficult,” Steve Dunham said.

The experiments are modeled on work being done in pharmaceutical companies and university research institutes where geneticists



Biochemists Steve and Shari Dunham synthesize DNA in the lab.

probe for ways to repair damaged genes. The Dunhams are particularly excited about research on telomeres, bonding agents that hold together DNA strands. As cells divide and reproduce their genetic material in each new cell, the telomeres shorten and eventually disappear, Steve Dunham says. This eventually causes molecular dysfunction that may explain how aging occurs. Finding a way to introduce telomeres into damaged DNA could retard or even eliminate the aging of cells that leads to disease and physical infirmity. “Gene therapies could be used to stop the spread of cancer cells,” he said.

The work is endlessly fascinating, says Shari Dunham. “There is so much that is being learned,” she said. “The hardest part is trying to keep up.” ♦

Peter Westervelt, Classic Professor

Professor Peter Westervelt, who taught classics for 26 years before a physical disability prevented him from remaining active in the classroom, officially retired from the faculty this year. In 1961 Westervelt received his Ph.D. from Harvard and came to Colby as an instructor. Following his appointment to full professor in 1978, he taught classes for several more years.

Since leaving classroom teaching, Westervelt has remained a scholar and a teacher and, among other pursuits, has edited faculty books, the *Colby Quarterly* and other publications. At the annual faculty and trustee dinner in May, President Bill Cotter expressed gratitude for Westervelt’s friendship and advice—and for private tutoring in Latin to prepare for commencement recitations.

Cotter’s tribute recognized other family members, too. Westervelt’s wife, Nancy (Fortune ’54), worked for the Dean of the College, Alumni Relations and Communications during the 1980s. Daughter Sarah Bizier is a registered nurse in the Colby health center, and two other children are not only Colby graduates but were valedictorians—Peter ’85 and Hilda ’92—“a truly amazing record,” Cotter said. ♦

Pundits & Plaudits

Interactive Barney: Good or Evil?

On May 21 the *Pittsburgh Post-Gazette*, in a story that compared Microsoft’s interactive Barney toy with Dr. Frankenstein’s monster, quoted Batya Friedman (computer science) on the social, developmental and ethical implications of high-tech toys. While programmers and toy makers should consider carefully how their toys will be used, they should be aware that their inventions will not always be used as intended. “The way tools are designed can make them more suitable to certain tasks,” she said. But while “human behavior may be constrained or prodded by features of technology, it is not determined by it,” she said.

Constitutional Exercise

On May 5, David Broder’s syndicated column, about the Center for Civic Education’s program “We the People: The Citizen and the Constitution,” ended with this: “Anthony Corrado, a distinguished political scientist at Colby College in Maine, has judged the [Center for Civic Education’s] contest for eight years and has helped train teachers at summer institutes on using the curriculum. He takes the time, he told me, because ‘the best antidote to cynicism is understanding the basic principles of our system of government and being challenged to apply them to today’s problems.’” Broder’s column appears in 293 newspapers.

Family Values in a Bottle?

As the hype and excitement around the Star Wars prequel reached a fever pitch in May, the *Christian Science Monitor* and CBS.Marketwatch.com interviewed David Lubin (art and American studies) about the phenomenon. Lubin told CBS that Hollywood would love to find the formula for Star Wars’ appeal. “[George Lucas] combines our contemporary fascination with technology—these are very high-tech films—with old-fashioned heroics and old-fashioned family-value systems,” Lubin said. Lucas “sends them out of the theater feeling good.... I guess if Hollywood could bottle that, they would. But so far they haven’t been able to.” The entire Lubin interview is on line (<http://cbs.marketwatch.com/archive/19990515/news/current/soapbox.htm>).

Breaking China News

At the height of tensions between the U.S. and China following the recent NATO bombing of the Chinese embassy in Belgrade, a *Washington Post* article quoted Suisheng Zhao (government). Though China joined the Nuclear Non-Proliferation Treaty and Comprehensive Test Ban Treaty, Zhao said these acts did not prevent Washington “from selling F-16 fighters to Taiwan in ’92, forcing inspection of a Chinese freighter suspected of transporting chemical agents to Iraq in ’93, and sending aircraft carriers to the Taiwan Strait in ’96.”