

## Professional Scientists, Move Over. Here Come the Amateurs

Shawn Carlson, San Diego State University

San Diego: Nestled in a small office in the Physical Sciences building at San Diego State University a new nonprofit group is challenging the Ivory Tower monopoly on scientific research. The Society for Amateur Scientists (SAS) is an unprecedented collaboration between professional and amateur scientists, and if they get their way, they will forever change how science gets done.

SAS is founded on the premise that it doesn't take a Ph.D. to do research. With the right support, they claim, even everyday people can make important scientific discoveries.

The fact that this idea makes some scientists bristle doesn't bother Shawn Carlson, the 35 year old physicist who founded SAS about a year ago. Carlson is a professional scientist with a mission. "Scientific talent is not limited to the University halls: he says. "There are thousands of people out there who could do good science if only they were supported, networked and informed. Our mission is to empower everyday people to make real contributions to science." Carlson claims that SAS can help almost anyone make discoveries. "If you have the interest, we can put you right on the scientific frontier," he says.

When pressed to support his belief in the scientific ingenuity of the common citizen, Carlson fires off an impressive list of discoveries. Animal tracks in New Mexico from before the age of dinosaurs, supernovae in distant galaxies, prime numbers with more than 10,000 digits, and a calibration error in an important NASA satellite, are only a few of the discoveries he says were made recently by amateurs. "Two amateurs recently developed a treatment for a fatal disease. When Augusto and Kayla Odone's young son was diagnosed with ALD their doctors gave them

no hope. So, with no support whatsoever they set out on their own to find a treatment. Through brilliant scientific detective work they developed a drug which has already saved hundreds of children's lives. Now that's high-caliber scientific talent!" Carlson says.

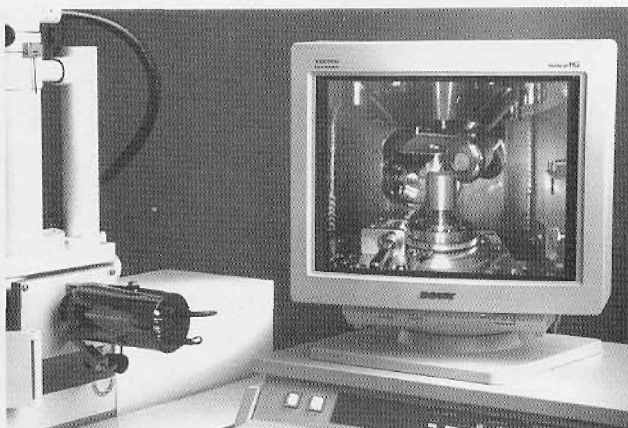
Carlson concedes that important amateur discoveries are rare, but he insists that's because amateurs have no support. "The fact that they happen at all proves that amateurs can make discoveries. Think of what may be possible if all this talent was supported, sharpened and directed at important problems," he says. In fact, Carlson maintains that amateurs have only scratched the surface of their potential. "Technology has brought extremely powerful investigative tools within everyone's reach. Today's amateurs can do things that only professionals could do just five years ago. We're putting these tools in peoples' hands and turning them loose on the world."

The Society for Amateur Scientists is launching a number of national research programs specially designed for amateur participation. "We're developing programs in biology, astronomy, botany, geology, seismology, atmospheric, mathematics, computer science, and genetics. We're even developing a visionary project in neutrino astrophysics," says Carlson. They have already sponsored expeditions to observe solar eclipses. "We're part of a national collaboration that has monitored ozone levels in the stratosphere as the ozone-producing sunlight is blocked out. This is very important work and it will be our privilege to get the very first data," he says.

SAS volunteers include housewives, engineers, teachers, journalists, entrepreneurs, and university professors including two Nobel Prize winners. Their strategy is to bring professionals and amateurs together for the benefit of both. The professionals design research programs that amateurs can carry out and then help the amateurs gain the skills needed to develop projects of their own. "We are preparing to support amateur projects with grants, awards, equipment and expert advice. Our philosophy is to focus on people and let the science largely take care of itself," Carlson says.

John Lighton is an assistant professor of biology at the University of Nevada and an SAS volunteer. "SAS is absolutely heretical," he says. "I love

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it!" Leghton agrees that science has a lot to gain from amateur participation. "The more science that gets done by amateurs, the more professionals are free to do those experiments that only professionals can do," he says. Lighton is writing a column for SAS's quarterly journal and is looking forward to mentoring amateurs in biology. "There is nothing more exciting than helping to unlock someone's potential for discovery," he says.

Forrest Mims III is an amateur scientist in Texas. Even though he has no formal scientific training, Mims has become one of the world's leading ozone scientists. His \$500 home-made instrument lets him measure stratospheric ozone from his backyard with precision which reveals NASA satellites. "It's a lot of work, but the rewards are incredible," he says. Mims is a contributing editor to SAS's journal and a strong supporter. "I think SAS is doing an fantastic job. It's great that some professionals are finally seeing the amateur community as a vital resource."

When asked what amateurs can contribute Mims is emphatic. "A lot! For one thing having no budget forces amateurs to be clever. We know how to get things done on a shoestring." Mims says that NASA once flew him to Washington to share his expertise on high-quality low-budget science. "The Society for Amateur Scientists gives the entire amateur community support that it has never had before. I know firsthand how much talent is out there. By freeing people to contribute according to their talents SAS is helping to make discoveries that otherwise might be long in coming. It's very exciting," he says.

But not everyone is enthusiastic. According to Carlson, some scientists think helping amateurs is a waste of time. "It takes most scientists a decade to earn their Ph.D.s. Some people don't easily warm to the idea that a guy with no formal training can do the job almost as well as they can." But Carlson is undaunted. "Sure, there are some things that amateurs just can't do. A formal education means a lot. But there are many places where amateurs can make real contributions. The Society for Amateur Scientists is totally dedicated to helping them get there."

When asked who should join the Society for Amateur Scientists, Carlson smiles. "It doesn't matter how little experience you have. If you dream of

making discoveries, this is the place you should be."

For a free copy of our newsletter, the Amateur Scientists' Bulletin, and a membership application, please call (800)873-8767. ■

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*Ed. Note: Microscopy Today neither agrees or disagrees with the substance of this article and only hopes for the interest of our readers. I will observe that Dr. Carlson has a Ph.D. in physics and of the 34 members of their Board of Directors and Advisory Board, 25 have Ph.D.s.*

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