volved with the newsletter as a sponsor. Because planetariums represent the largest and most effective interface between professional astronomy and teachers, we are especially pleased to have them as partners in this endeavor and are working with them to encourage even wider redistribution of each issue through local planetariums.

3. Looking to the Future

At present the direct circulation of the newsletter is over 20,000 and still climbing. In many schools and school districts, the initial recipients make dozens or hundreds of additional copies for further distribution. In addition, articles from our newsletter have been excerpted and reprinted in many dozens of local and national magazines and newsletters read by teachers.

We would like to encourage our colleagues from around the world to translate and distribute the newsletter in their own countries, if it is appropriate. To obtain some recent issues and more information, please write the author at:

Teachers' Newsletter Distribution
Astronomical Society of the Pacific,
390 Ashton Ave.,
San Francisco, California 94112, U.S.A.

Whether or not you wish to (or need to) translate, please feel free to duplicate copies to teachers and others who can use them. (Each issue contains a paragraph giving educational institutions blanket permission to make additional copies). The only thing we ask is that you either reproduce the issue in full or — if you only use specific articles — that you give full credit and copyright information on each copy.

A SCIENCE AND MATHEMATICS TEACHING CENTER

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1. A Crisis in Science Education?

It is widely known that a crisis in science and mathematics teaching exists in the United States. This crisis has reached all levels of education, from elementary to secondary to colleges and universities. The problem, which is easy to define but difficult to resolve, is trifold: there are not enough high-quality science and mathematics teachers; present teachers are teaching out-of field or are out-of-date and in need of subject updating; and the average education graduate is only minimally

qualified to teach science and math. These factors have caused national and state "alarms" to be published that point out the increasing mediocrity and an overall lack of science education in our nation's schools.

2. Science and Mathematics Teaching Center

Central Michigan University, long among the nation's leaders in the training of teachers at all levels, is taking steps to remedy this alarming situation. A Science and Mathematics Teaching Center, designed to confront the problem head-on, has been founded. The Center's major purpose is to improve the quality of science and math teaching. This goal is being accomplished through a series of workshops, seminars, in-service programs, conferences, and teacher outreach programs.

3. What the Center Can Do For Teachers

Through a series of seminars, workshops, and mini-courses, the Center is well-prepared to instruct the teacher and prospective teacher in the latest developments in science and mathematics education. Even though these functions cover a wide range of topics, all have common elements, including:

- the emphasis upon hands-on processes or activities and the development of higher level thinking skills;
- the application of science and math to current events and technology;
- the introduction of new instructional materials and techniques; and
- the covering of interdisciplinary topics which do not fit well in existing courses.

For instance, some of the seminars/workshops presented by the Center have included series on Halley's Comet; Mathematics and the Gifted Student; Utilizing the Apple Computer in the Physics Lab; Keeping Reptiles in the Classroom; and National Science Teachers Association (NSTA) Materials For Teachers. Future programs will be devoted to the Michigan Educational Assessment Program (MEAP) science tests, problem solving in math, influencing females to study science/math, weather instruments, and examination of moon rocks. Major science conferences, such as the 35th Edison Science Institute, featuring many of the nation's best science speakers, also are planned.

Continuing relationships with the NASA educational materials network via the NASA Regional Teachers Resource Room at the Center and the National Science Teachers Association allows firsthand examination of relevant materials and classroom science activities/experiments. Just as science has made tremendous strides over the years, so have the materials and equipment that accompany the teaching of science and math. The Center will serve as a centralized source of materials that are vital to the continuing education of teaching professionals. This function is a team effort with the adjacent Instructional Materials Center.

There are many new materials in science and math education, many of which remain unknown to local school districts. Often these materials require special

maintenance, care, and instruction in their use. The Center, with its facilities and expertise of its faculty members, will address those special needs. An example of this new and promising technology is an interactive laser-video-disc-system that is being developed in particular subjects.

The Center will provide a science/math lab for student microteaching. This will allow for the videotaping of a teacher's performance for evaluation at a later date.

The Center has worked very closely with hundreds of Michigan school districts and other universities in an effort to improve the quality of science and mathematics teaching. Along with arranging for mini-courses, workshops, and seminars for teachers, the Center also will assist in the evaluation of a school district's curricula and make recommendations for improvement. This effort includes extensive and cooperative grant development with school districts for the improvement of science/math education. Recently, a major grant helped train master teachers of science and mathematics at the middle school level who then returned to their school districts to conduct professional development activities for their fellow teachers.

THE WEEK-END ASTRONOMY CLASS FOR TEACHERS

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1. Introduction

Astronomy is an integral part of many high-school science programs. Project STAR and the Science Assessment and Research Project at the University of Minnesota have recently recognized this. In addition, astronomy is a part of most elementary and middle-school science programs. In the Platteville, Wisconsin, school system, the solar system is a unit of study for all third grade students and a study of the stars is a part of the eighth grade science program. This is also true for other school systems in this area, in the Chicago area, and I would suspect, across the nation.

However, most elementary school teachers have had little science course work and none in astronomy. Middle-school and high-school teachers have better backgrounds for teaching science but little or no astronomy course work. Some of those who teach astronomy are active in local astronomy groups and read *Astronomy* or *Sky and Telescope* magazines, but this is the exception rather than the rule.