This report covers the period 1 July 1996 through 30 June 2000.

1 PERSONNEL

W. D. Heintz retired from his position as Professor of Astronomy in August 1998, Eric Jensen joined the faculty in September 1998 as Assistant Professor of Astronomy. J. E. Gaustad retired in August 2000. David H. Cohen joined the faculty as Assistant Professor of Astronomy in September 2000.

Gaustad was assisted in his research by several undergraduate students during this period, including Swarthmore students Katherine Hall and Peter Austin, as well as Andreas Voellmy (Haverford College) and Daniel Seaton (Williams College). Jensen was assisted in his research by Swarthmore students Beth Biller, Brendan Karch, and Allyn Dullighan, and by Arianne Donar (Wesleyan University).

Under an exchange program supported by a grant from the Keck Foundation, two Swarthmore students worked at other institutions: Katherine Hall at Wellesley College (1997) and Allyn Dullighan at Wellesley College (1999). In addition Beth Biller worked at NRAO (1998) and at Maria Mitchell Observatory (1999).

2 INSTRUMENTATION

The Sproul 61-cm refractor is now equipped with a CCD camera.

A robotic CCD wide-angle camera system, developed in collaboration with Wayne Rosing of Las Cumbres Observatory, was installed at Cerro Tololo Inter-American Observatory in Chile in January 1997. Each image covers an area $13^\circ \times 13^\circ$ with a resolution of 0.8/pixel.

3 RESEARCH

W. D. Heintz continued micrometer observations of double stars at the Sproul 61-cm refractor until October 1997.

Heintz, in collaboration with H. J. Augensen (Widener University), uses the CCD camera on the refractor for variable-star photometry. Targets are slow semi-regular variables, and stars catalogued as variable suspects but not yet studied in detail. About 35 of these stars have been confirmed as variable, and will be followed further.

The robotic CCD camera installed at CTIO is being used by J. E. Gaustad and collaborators to survey the entire southern hemisphere sky at Ha to a brightness level of 1 Rayleigh at 0.07 resolution. The purpose is to study the structure of the interstellar medium as well as to set limits on the contribution of Galactic free-free emission to the microwave background. The survey is expected to be completed in late 2000 with publication of the images planned for early 2001.

Since joining the faculty in September 1998, Jensen has continued his work on observational studies of planet formation around young stars. He has used submillimeter photometry from SCUBA on the James Clerk Maxwell Telescope (JCMT) to place sensitive constraints on the masses of protoplanetary disks in pre-main-sequence binary stars; most young binaries with separations less than 100 AU harbor disks with masses less than $10^{-4}$ $M_\odot$. He has also used near-infrared imaging polarimetry of young binaries to show that there is a tendency for disks in wide binaries to be aligned with each other, rather than randomly distributed. Finally, Jensen and collaborators are pursuing a new observational program to search for older ($\sim 10^7$ yr) pre-main-sequence stars near ($\sim 50$ pc) Earth, using ROSAT and Hipparcos data and follow-up optical spectroscopy. The first observing run of this program was completed at CTIO in August 2000.

PUBLICATIONS


Jensen, E.L.N. 1999, “An Introduction to Isolated Young Stars and the TW Hya Association,” BAAS, v. 31, no. 5, 32.01


J.E. Gaustad