FINAL REPORT
For Period April 1, 1972 - June 30, 1974
Under Contract No. NGR 12-001-111
Mauna Kea Observatory Infrared Observations

Principal Investigator:
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Institute for Astronomy
University of Hawaii
I. Introduction

The referenced grant, in the sum of $38,282, was provided to help support the operation of Mauna Kea Observatory, and specifically to facilitate research programs in infrared studies of stellar and galactic sources.

II. Time Allocations for Visiting Astronomers

During the 26-months covered by this grant, 13 groups of visiting astronomers were granted a combined total of 103 nights on the 2.24-meter telescope for infrared observing studies. The number increased toward the end of the grant period, as a result both of the larger number of high-quality applications received as the reputation of Mauna Kea as a site for infrared observation became better established, and because of the willingness on the part of the University of Hawaii's Institute for Astronomy to grant time to guest observers.

Infrared programs carried out by guest observers during the grant period are listed in the table.

III. Time Allocation for Staff Infrared Astronomy

Support under this grant has also facilitated infrared observing programs by our own staff. During the grant period, a total of 252 nights were assigned to staff members for galactic and solar system infrared observation using a broad variety of radiometric and spectroscopic instrumentation.

IV. Publications

During the grant period, 11 papers by our own staff in the areas of stellar and galactic infrared research or dealing with Mauna Kea as an infrared site, were published or accepted for publication. Nine papers were submitted or published by guest observers. A listing is shown below.

**STAFF PUBLICATIONS**


Cruikshank, Dale P. and Morrison, D. "Radii and Albedos of Asteroids 

Morrison, D. and D.P. Cruikshank, "Physical Properties of the Natural 

Murphy, Robert E. and Fesen, Robert A. "Spatial Variations in the Jovian 

Dyck, H.M., Capps, R.W. and Beichman, C.A. "Infrared Polarization of the 

Morrison, D. with Chase, S.C., Miner, E.S., Munch, G., and Neugebauer G. 
"Preliminary Infrared Radiometry of Venus from Mariner 10," Science, 

GUEST OBSERVER PUBLICATIONS

E.E. Becklin, and G. Neugebauer, "The Spatial Distribution of the Infrared 

E.E. Becklin, G. Neugebauer, J. Frogel, D. Kleimann, S. Persson, C. 
Wynn Williams, "Infrared Emission from the Southern H II Region H2-3," 

of Sources in H II Regions, the Galactic Center, and NGC 253," 
(submitted October 1973).

C.G. Wynn Williams, E.E. Becklin, G. Neugebauer, "Infrared Studies of H 

Temperature at 345, 450, and 1000 Microns," Astron & Astrophys, 


D.W. Gezari, R.R. Joyce, M. Simon, G. Righini, "350-Micron Mapping of the 
### Infrared Programs Carried Out by Guest Observers at Mauna Kea

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
<th>Number of Nights</th>
<th>Program</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>April 1, 1972 - September 30, 1972</strong></td>
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<td></td>
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<tr>
<td>J. Gaustad</td>
<td>U.C. Berkeley</td>
<td>6</td>
<td>Spectroscopy at 5 to 20 microns</td>
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<tr>
<td>F. Low/G. Rieker</td>
<td>U.C. Berkeley</td>
<td>5</td>
<td>H II regions and extragalactic objects at 400 microns</td>
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<tr>
<td><strong>October 1, 1972 - March 31, 1973</strong></td>
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<td></td>
<td></td>
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<tr>
<td>J. Gaustad</td>
<td>U.C. Berkeley</td>
<td>6</td>
<td>Fourier-transform spectroscopy at 10 to 20 microns</td>
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<tr>
<td>I Nolt</td>
<td>U. of Oregon</td>
<td>4</td>
<td>Radiometry of galactic sources at 35 microns</td>
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<tr>
<td><strong>April 1, 1973 - September 30, 1973</strong></td>
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<tr>
<td>J. Gaustad</td>
<td>U.C. Berkeley</td>
<td>5</td>
<td>Emission spectra of stars at 10 to 20 microns (Fourier transform spectroscopy)</td>
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<tr>
<td>D. Gautier</td>
<td>Observatoire de Paris</td>
<td>8</td>
<td>Jupiter at 8 to 12 microns</td>
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<tr>
<td>I. Nolt/J. Radostitz</td>
<td>U. Oregon</td>
<td>5</td>
<td>Emission and transmission of sky at 28 to 40 microns. Also broad-band 35-micron photometry on bright sources</td>
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<tr>
<td>with R. Murphy/W. Sinton</td>
<td>U. of Hawaii</td>
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<tr>
<td>G. Neugebauer</td>
<td>Cal. Tech.</td>
<td>7</td>
<td>Multiplier photometry and spatial mapping of stars, H II regions, dust clouds, and galaxies at 10 and 20 microns</td>
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<tr>
<td>Name</td>
<td>Institution</td>
<td>Number of Nights</td>
<td>Program</td>
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<tr>
<td>M. Simon</td>
<td>SUNY, Stonybrook</td>
<td>4 on 224-cm</td>
<td>Sun, moon, galactic center, H II and dust regions, extra galactic objects at 350 and 450 microns.</td>
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<tr>
<td></td>
<td></td>
<td>8 on 61 cm</td>
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<tr>
<td>J. Wampler</td>
<td>U.C. Santa Cruz</td>
<td>5</td>
<td>Deep photography of selected regions in the North Galactic Cap (350 microns)</td>
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<tr>
<td>October 1, 1973 - June 30, 1974</td>
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<tr>
<td>A. Lane/T. Johnson</td>
<td>Jet Propulsion Lab</td>
<td>8</td>
<td>Photometry of Comet Encke; photometry of vidicon, comets, Saturn, Uranus</td>
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<tr>
<td>M. Simon</td>
<td>SUNY, Stonybrook</td>
<td>12</td>
<td>350-micron photometry of comet Kohoutek, and Orion region; Obs. of IRC 10216 at 350 microns and 1 mm.</td>
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<tr>
<td>C. Townes</td>
<td>U.C. Berkeley</td>
<td>10</td>
<td>20 and 10-micron spectroscopy of planetary nebulae, stars, and the Galactic Center. High-resolution observations in the 5- and 10-micron region.</td>
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