was constructed from the residual line profile variations calculated by subtracting from each profile the mean for the series. The corresponding Fourier transform is presented in Figure 21. Intensive photometric campaigns (Breger *et al*, Astron. Astrophys., **214**, 209, 1989) have detected several unidentifiable low-degree modes at frequencies near 13.5 cycles/day. These individual frequencies are not resolved in our data but we find the power at this frequency can be identified with an |m| = 3 mode. Additional power is associated with an |m| =10 mode at f=15.5 cycles/day. The sensitivity to both low- and high-degree modes demonstrates the enormous advantages offered by high resolution spectroscopy as a tool for mode identification of nonradially pulsating stars.

E.J. Kennelly and G.A.H. Walker
(University of British Columbia)

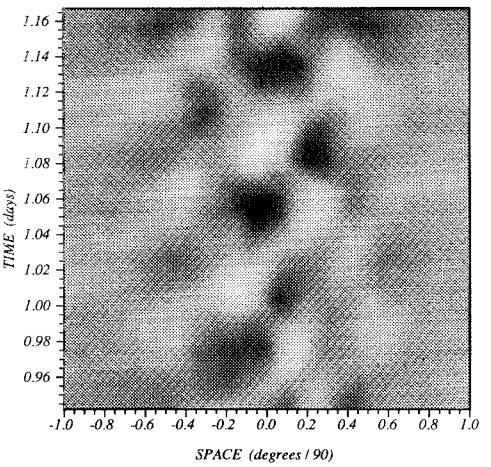

Figure 20: The line profile variations of θ^2 Tau are shown as a grey-scale map on a space-time grid. The map was interpolated from a time series of 52 observations. The position within the line profile (in units of velocity) has been transformed into angular coordinates on the stellar surface.

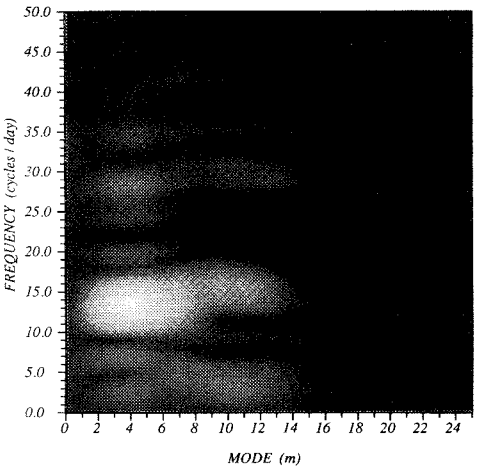

Figure 21: A two-dimensional Fourier transform calculated from the line profile variations of θ^2 Tau is used to simultaneously identify modes and frequencies of oscillation of the star.

DIRECTORS' CORNER

Staff Changes

Mel Yanos who has been serving as accountant at the Waimea headquarters for the last two years, has accepted a new position at the Kona Village Resort in last March. He has been replaced by DeeDee Warren who already has an 8 years business management career behind her. Deedee has spent 7 years at the St-Louis School in Honolulu and the last six months as controller at the Kaneohe Marine Corps base.

Roland Bacon, who spent one year at Waimea on leave from the Observatoire de Lyon, went back to his home institute in last March. He shared his vast experience of TIGER observation and reduction procedures with the CFHT staff and paved the way for the implementation of this observing mode in MOS-SIS.

CFHT has now a complete staff in the optics group. The last vacant position has been filled by Wendy Harrison. Wendy has accumulated an impressive experience as senior research engineer for AVCO RESEARCH at the Maui Satellite Tracking Station for the last 5 years. She will be technician in charge of the new f/4 coudé spectrograph. Her experience will also be put to contribution in the new CFHT adaptive optics project.

1990 CFHT Refereed Staff Publications

Arsenault, R., Roy, J.-R., Boulesteix, J. "Large-Scale Formation of Massive Stars in the Spiral Galaxy NGC 4321," *Astron. Astrophys.*, **234**, 23.

*Bender, R., **Nieto, J.-L.** "Internal Kinematics of Low-Luminosity Elliptical Galaxies," *Astron. Astrophys.*, **239**, 97.

Boesgaard, A.M., Friel, E.D. "Chemical Composition of Open Clusters. I. Fe/H from High-Resolution Spectroscopy," *Astrophys. J.*, **351**, 467.

***Bouvier, J.** "Rotation in T Tauri Stars. II. Clues for Magnetic Activity," *Astron. J.*, **99**, 946.

Davidge, T.J. "Two Micron Spectroscopy of the Nucleus of M32," *Astron. J.*, **99**, 561.

Davidge, T.J., Maillard, J.-P. "Two Micron Spectroscopy of the Blue Compact Dwarf Galaxy Haro 2," *Astrophys. J.*, **351**, 432.

Davidge, T.J., "Two Micron Spectroscopy of Galactic and M31 Globular Clusters," *Astrophys. J. Letters*, **351**, L37.

Davidge, T.J., Alloin, D., Jablonka, P. "Absorption-Line Gradients in the Optical Spectrum of the M31 Globular Cluster Vetesnik 42," *Astrophys. J. Letters*, **358**, L1.

Davidge, T.J. "CO and CN Absorption in the Near-Infared Spectra of Luminous M31 Globular Clusters," *J. Roy. Astron. Soc. Can.*, **84**, No.3, 166.

Davidge, T.J., De Robertis, M.M., Yee, H.K.C. "Long-Slit Spectroscopy of Near-Ultraviolet NH Absorption in the Nuclei of M31," *Astron. J.*, **100**, 1143.

Davidge, T.J., Pritchet, C.J. "The Nature of Bright Giants in the Halo of NGC 253 and Implications for the Distance Scale," *Astron. J.*, **100**, 102.

Friel, E.D., **Boesgaard, A.M.** "Chemical Composition of Open Clusters. II. C/H and C/Fe in F Dwarfs from High-Resolution Spectroscopy," *Astrophys. J.*, **351** 480.

Hammer, F., **Le Fèvre, O.** "High Spatial Imaging of 10 3CR Galaxies with $z \geq 1$ and Statistical Evidence for Selection Effects from Gravitational Amplification," *Astrophys. J.*, **357**, 38.

Le Fèvre, O., Hammer, F. "3CR 208.1: A Radio-Loud Quasar at z = 1.02 Gravitationally Amplified by a Foreground Seyfert Galaxy at z = 0.159," *Astrophys. J. Letters*, **350**, L1.

Nieto, J.-L., McClure, R., Fletcher, J.M., Arnaud, J., Bacon, R., Bender, R., Comte, G., Poulain, P. "The Core of the Elliptical Galaxy NGC 7052," *Astron. Astrophys. Letters*, **235**, L17.

***Nieto, J.-L.**, Aurière, M., Sebag, J., Arnaud, J., Lelièvre, G., Blazit, A., Foy, R., Bonaldo, S., Thouvenot, E. "The Optical Counterpart of the X-Ray Binary in the Globular Cluster NGC 6712," *Astron. Astrophys.*, **239**, 155.

Nieto, J.-L., Bender, R., Davoust, E., Prugniel, P. "The Low- Mass Extension of the Fundamental Plane of Elliptical Galaxies," *Astron. Astrophys.*, **230**, L17.

Pècontal, E., Adam, G., Bacon, R., Courtès, G., Georgelin, Y., **Monnet, G.** "Observation of the Central Region of NGC 5728 with the Integral Field Spectrograph TIGER," *Astron. Astrophys.*, **232**, 331.

*Racine, R. "Recherches astronomiques: peines et félicités," *J. Roy. Astron. Soc. Can.*, **84**, No.5, 324.

Sebag, J., Arnaud, J., Lelièvre, G., **Nieto, J.-L.**, Le Coarer, E. "High-Resolution Imaging Using Pupil Segmentation," *Optical Society of America* A, **7**, No.7, 1237.

***Simons, D.A.**, Hodapp, K.-W., Becklin, E.E. "High-Resolution Infrared Mapping of the Galactic Center: Imaging and Lunar Occultations," *Astrophys. J.*, **360**, 106.

CFHT author's names appear in bold print.
Please direct all requests for papers to primary author.
*Indicates papers based on observations other than CFHT.

E. Bryson, Librarian

CFHT New Imaging Plan

Largely owing to spirited discussions at the May 1989 User's Meeting in Meudon, and at subsequent Scientific Advisory Council and Board of Directors Meetings, a CFHT multi-year plan was elaborated and approved in the fall of 1989. Major new projects were:

- A new telescope control system (TCS IV)
- Improvements to f/8 and f/36 Cassegrain foci
- An Infrared Camera
- Development of adaptive optics
- Remote Observing from Waimea

Tied to this plan was also a significant increase in personnel, namely 3 new positions in the areas of Instrumentation Support.

Unfortunately, this ambitious ($ 5.5 million over a five-year period) endeavor has ultimately not been funded, and we had to fall back on a more modest $ 1.64 million three-year package, that does not involve any new personnel. The revised, "New Imaging Plan," has been strongly pushed by SAC and was approved by the Board of Directors in December 1990. The last hurdle was negotiated last April, when funding by NRC and CNRS was obtained.

Not too surprisingly the major components of the initial plan are still here, but with a number of provisos:

- TCS IV is not part of this plan. It has nevertheless been launched last November, but is scheduled for completion at best in 1993, due to manpower shortage.
- Our goals for the improvements of the Cassegrain upper-ends have been considerably reduced in scope; e.g. use of the f/36 mirror for fast tip-tilt correction is now probably out of the question.
- The Infrared Camera project is aggressively pursued, with first light expected as early as 1992, but will cover the non-thermal IR (1 to 2.4 μm) only. With the present caps on both the operating and personnel budget, we have currently no plan on an extension to longer wavelengths.
- The present plan will cover a large fraction of the development of a 1st generation CFHT adaptive "bonnette," but a significant contribution for the ordinary instrument budget will be necessary in 1994 and beyond.
- There is no provision anymore for remote observing at Waimea. However, the capital cost for video-link to the summit is presently decreasing by a factor 2 each year, with a similar decrease in the bandwidth needed. We have already a slow-scan system in operation, and should be able to afford a fast link, one year or two from now!

CFHT normal operating budget allows at best for a reasonable maintenance/upgrading of already existing instruments. With this New Imaging plan, which handily follows the MOS/SIS and the Coudé f/4, we are entering into exciting ventures, which should strongly contribute to maintain CFHT as a fully competitive telescope. For that we extend our thanks to the Agencies, the supervising bodies, and to our astronomical communities, for their support.

Guy Monnet

OBSERVING STATISTICS

The second semester of 1991 (91II) covers a total of only 165 nights since 91I was extended to include the July 11, 1991, Total Solar Eclipse. During 91II, the telescope is scheduled for scientific use on 146 nights (88.5%) and for engineering use on 19 nights (11.5%). This compares with 183 scientific nights (92%) and 16 engineering nights (8%) in 91I. The engineering time includes 10 days for a shutdown to work on the dome shutter, the dome crane, and to realuminize the primary mirror. Carrying out this last activity in 1991 will allow more engineering nights in 1992 to be used for commissioning the MOS/SIS and Coudé f/4 spectrographs. During the 146 scientific nights, 55 programs are scheduled. Within the 5.4 month interval there will be 11 upper-end exchanges. The following table summarizes the distribution of the scientific programs and the allocation of nights between various instruments and configurations.

CFHT INSTRUMENTS	Set-ups	Programs	Nights
Coudé spectrograph	3	5	16
FOCAM	4	8	25
FTS	1	4	12
Herzberg	2	5	9
MARLIN	1	1	4
Palila	1	1	3
CFHT INST. TOTAL	12	24	69

VISITOR INSTRUMENTS	Set-ups	Programs	Nights
Adaptive Optics	1	1	1
C10 micron	1	3	7
CIRCUS	1	5	12
FOS	1	2	6
FTS+NICMOS	1	2	3
HRCam	2	9	21
MONICA	1	1	5
Photometer	1	1	5
Speckle camera	1	1	4
SILFID	1	2	5
Wide Field spectro.	1	1	2
TIGER	1	3	6
VISITOR INST. TOTAL	13	31	77
SCIENTIFIC TOTAL	**25**	**55**	**146**

In this summary are included three discretionary nights being used to replace nights lost during the mercury spill.

Visitor instrument use represents 53% of all scientific observing. This unusually high value results from a larger number of visitor instruments than typical plus the expected substantial use of the HRCam. The average number of nights/program is 2.6.