

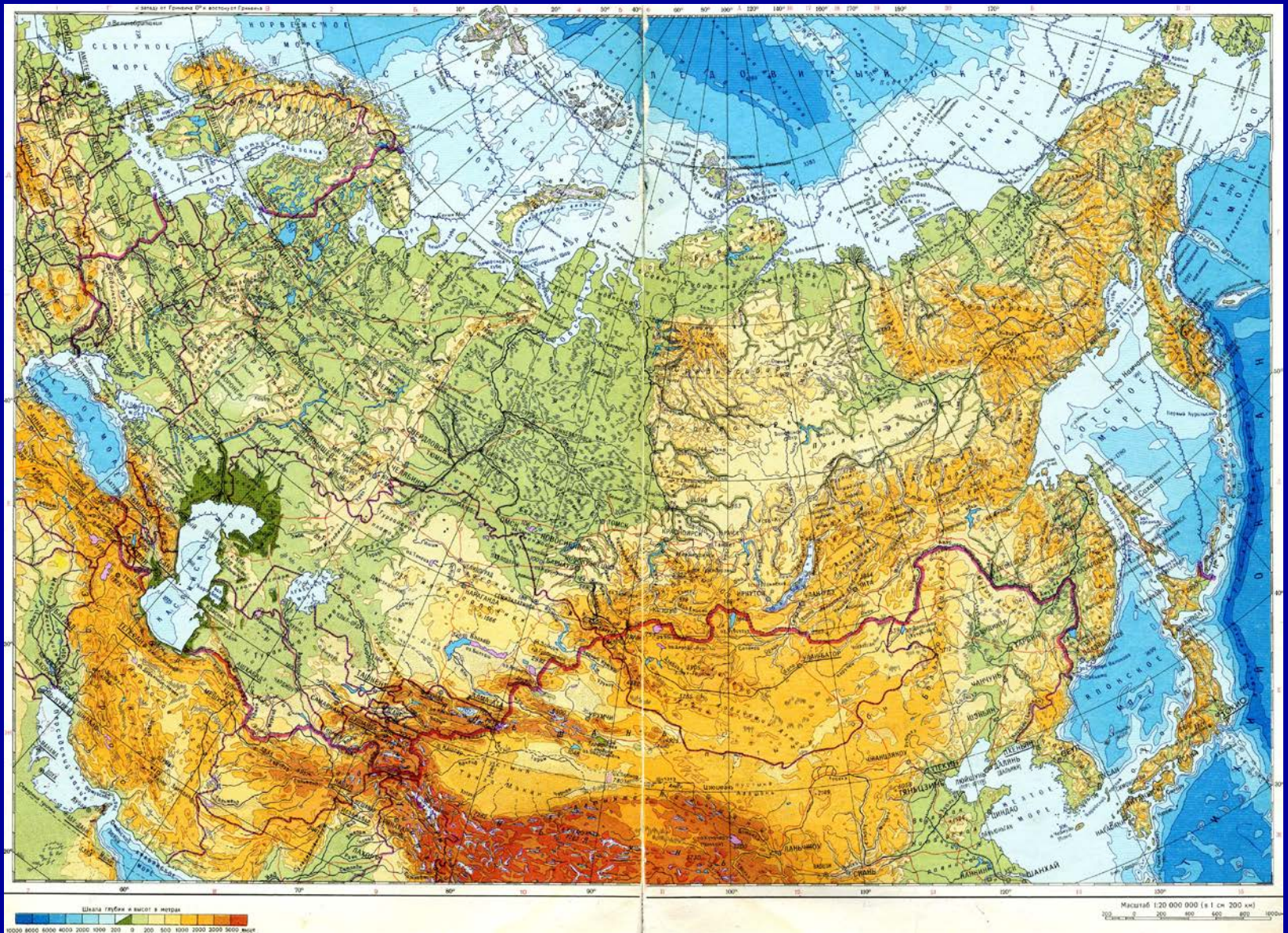


Y.Balega

**Soviet Bolshoi Azimuthal Telescope – the former
largest telescope in the world**

Maui 2013

Map of the USSR

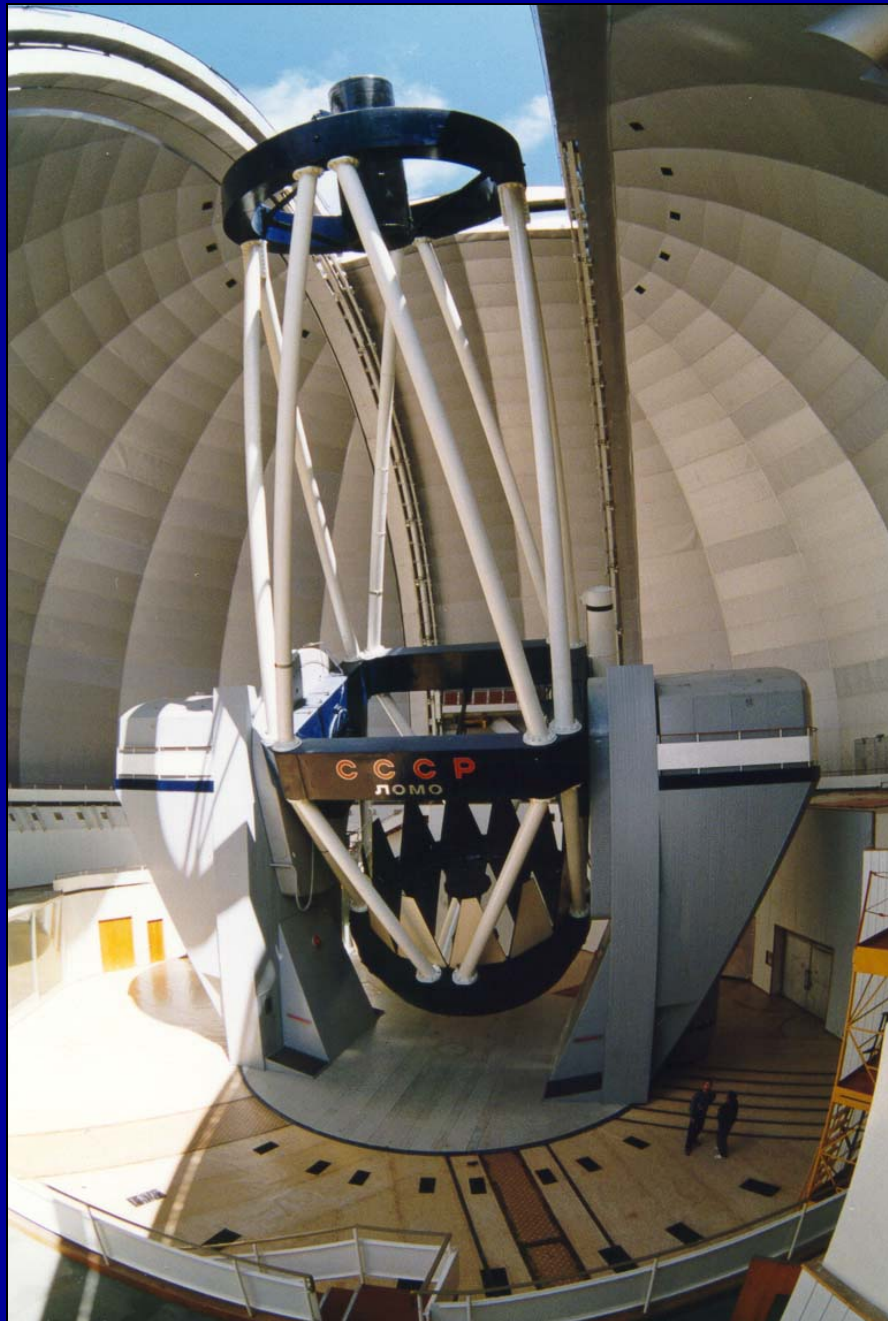


Academicians M.Keldych and L.Artsimovich in 1968



The dome of the 6 m telescope at the altitude 2100 m





The 6 m BTA telescope

PF Focal Reducer

PF Low-resolution Spectrometer

PF 2D Spectrometer (fibers)

PF Multi-lens Field Spectrometer

Fabri-Perot Spectrometer

Speckle Interferometer

2D High-speed Photometer

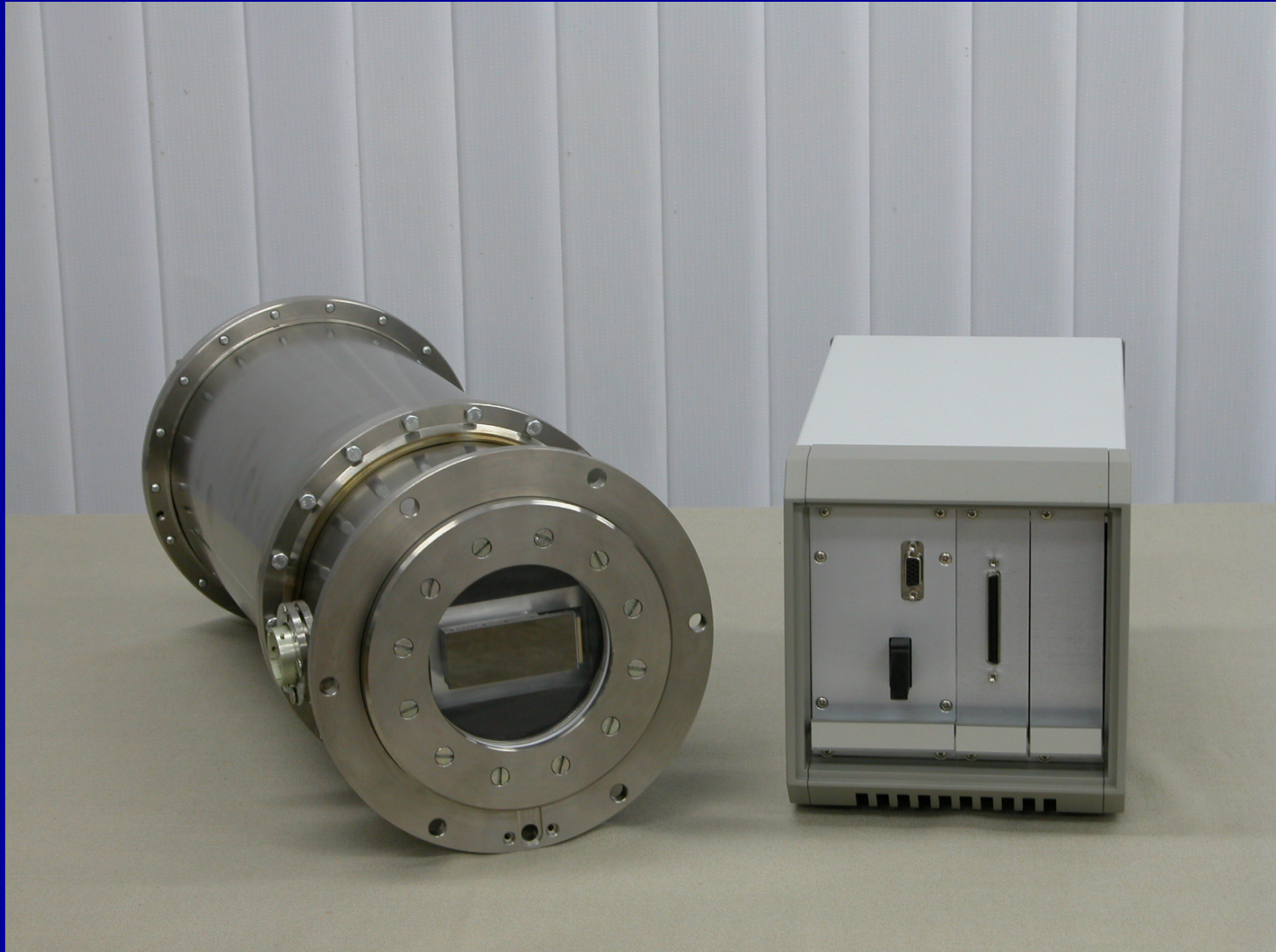
Nasmyth Echelle Spectrometer

Main Stellar Spectrometer

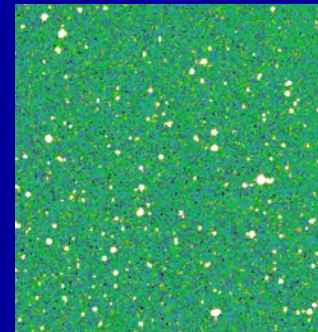
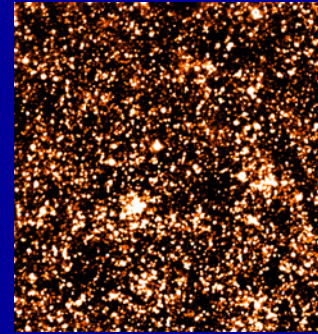
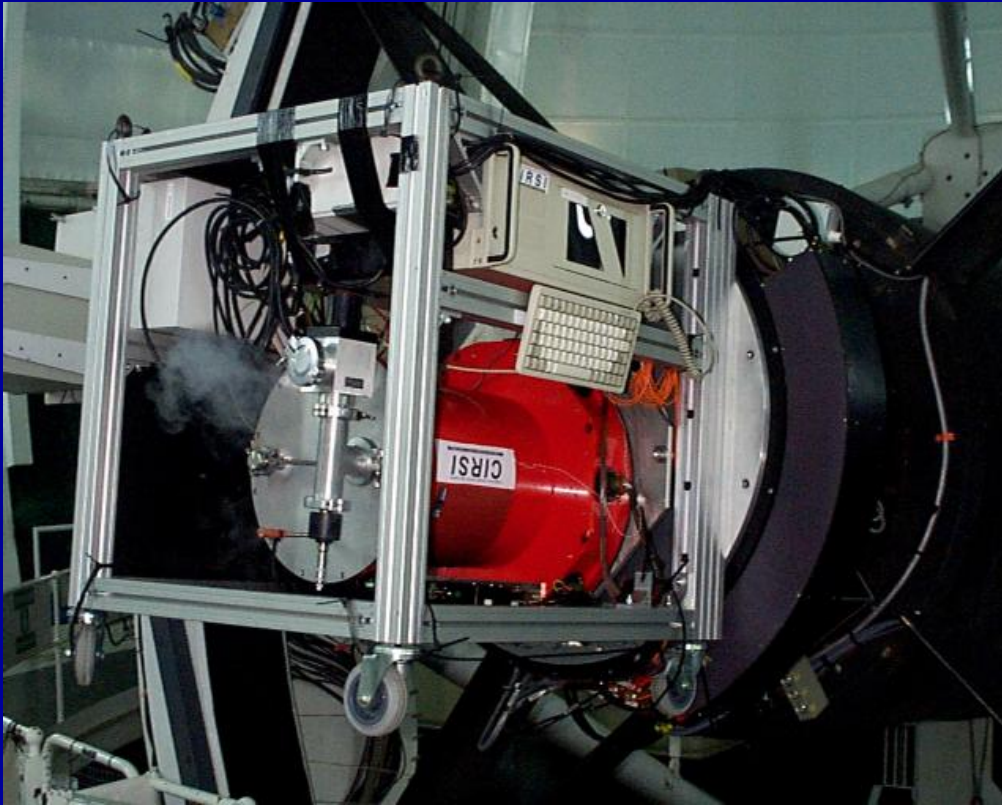


**Astronomical
village
N.Arkhыз**

4Kx2K EEV CCD for spectroscopy

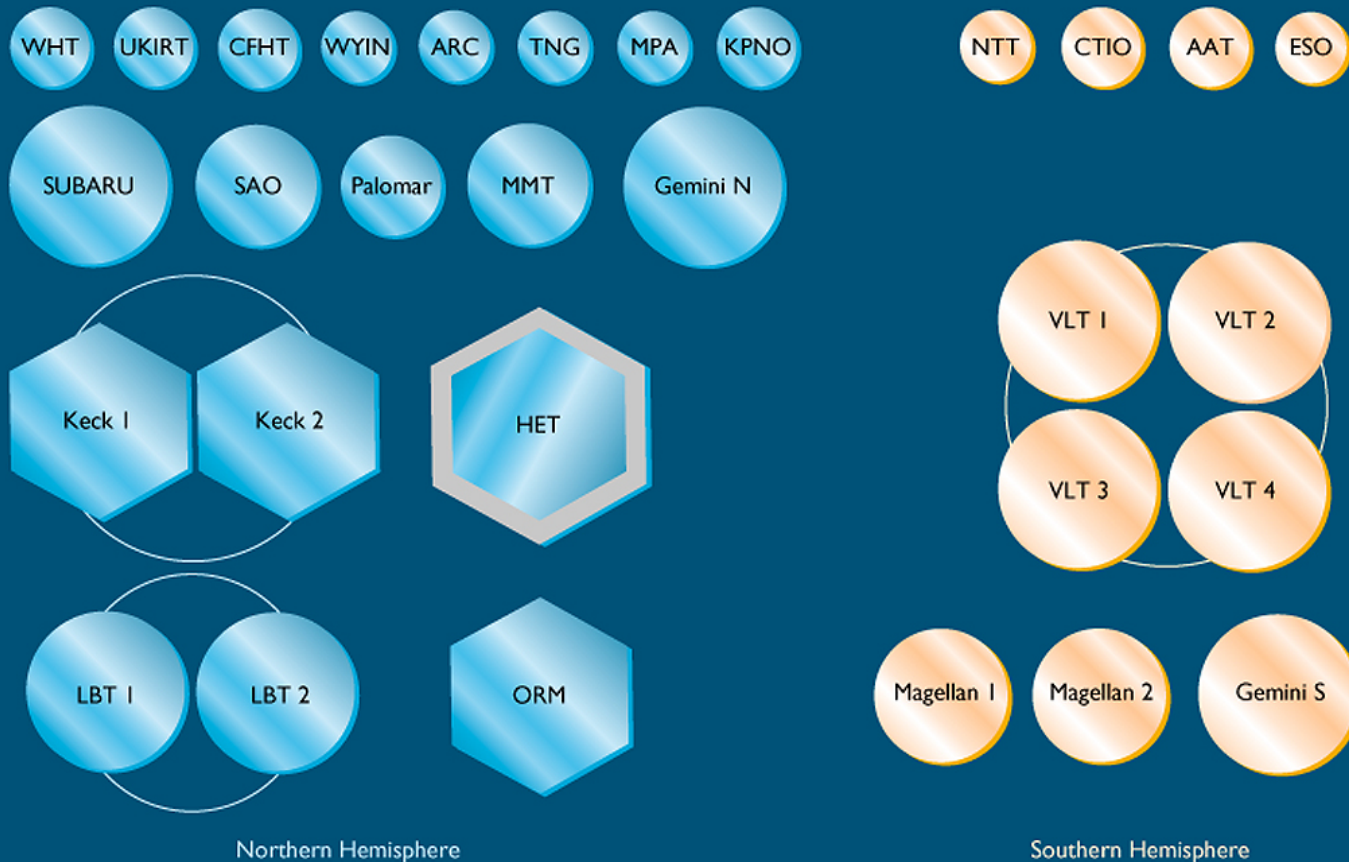


HAWAII-II detector for the IR spectrometer



Large optical telescopes in the beginning of the Millennium

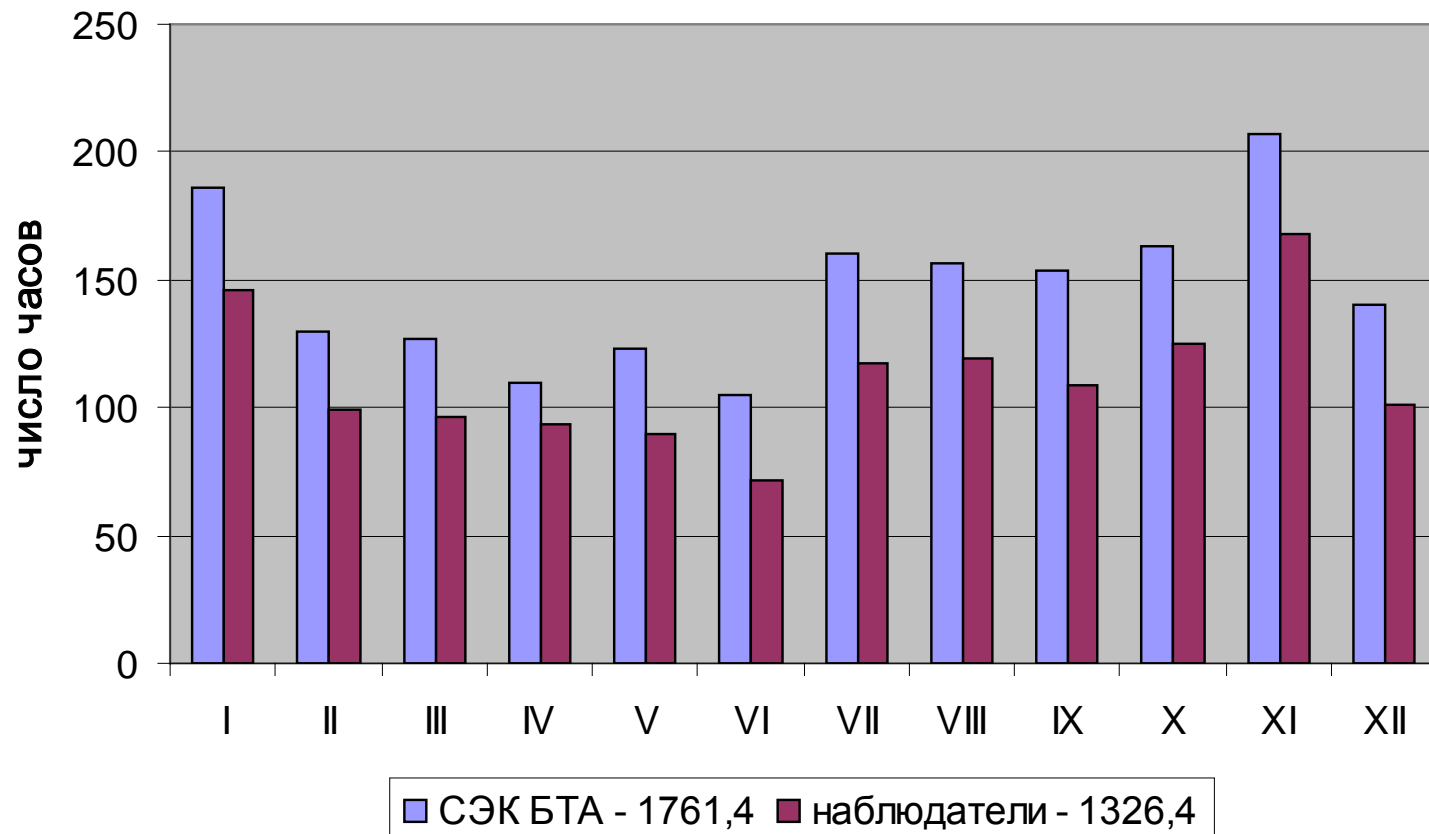
COLLECTING AREA OF THE LARGE TELESCOPES



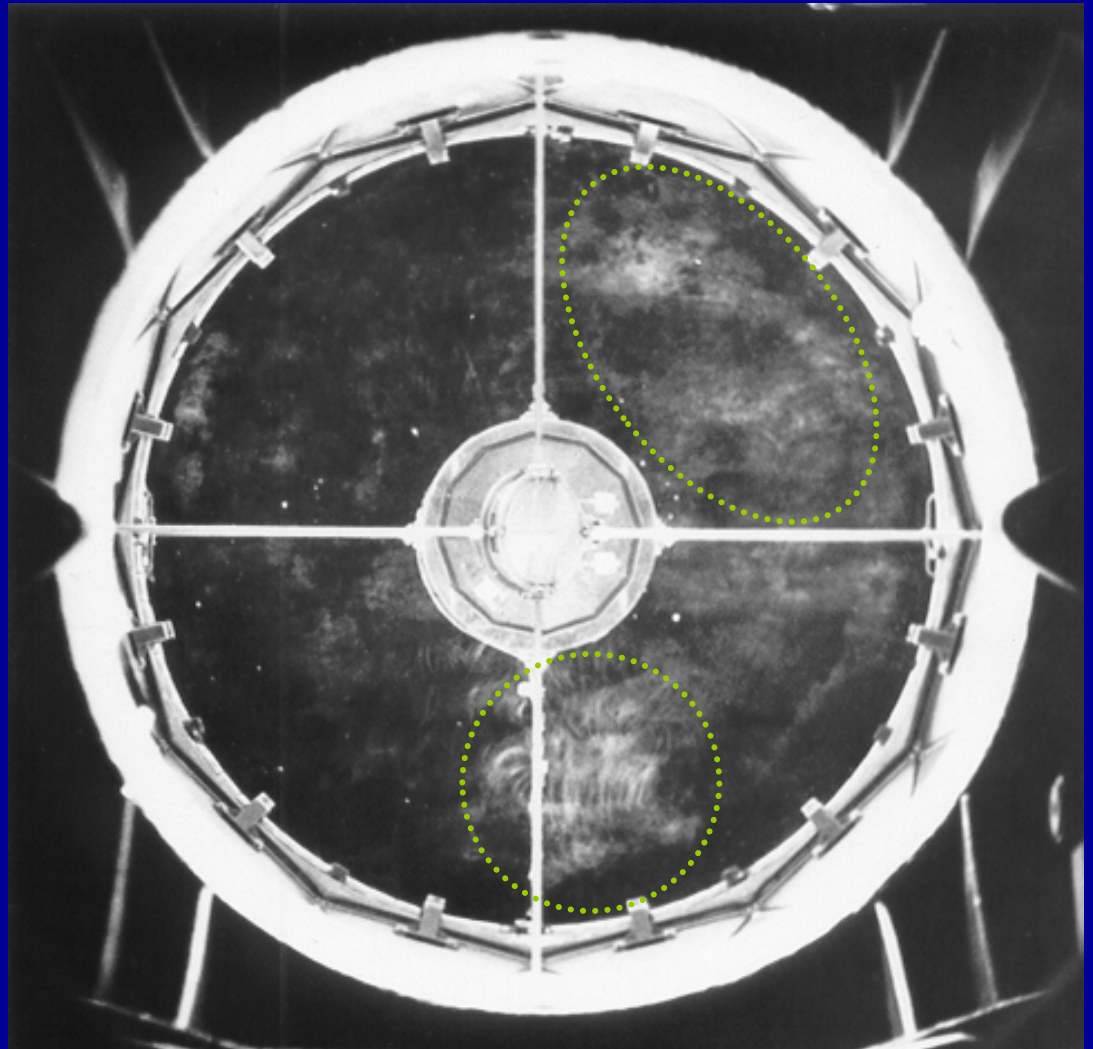
Total area is
~1000 sq. m

Average hours of observations vs month of a year

Среднее количество часов наблюдений на
БТА с 1996 по 2003 гг



Problems of the main 6m mirror



Polished layer degradation

Transforming 6 m BTA to 8 m VLT



The 8 m blank testing at Schott, Germany in 2003

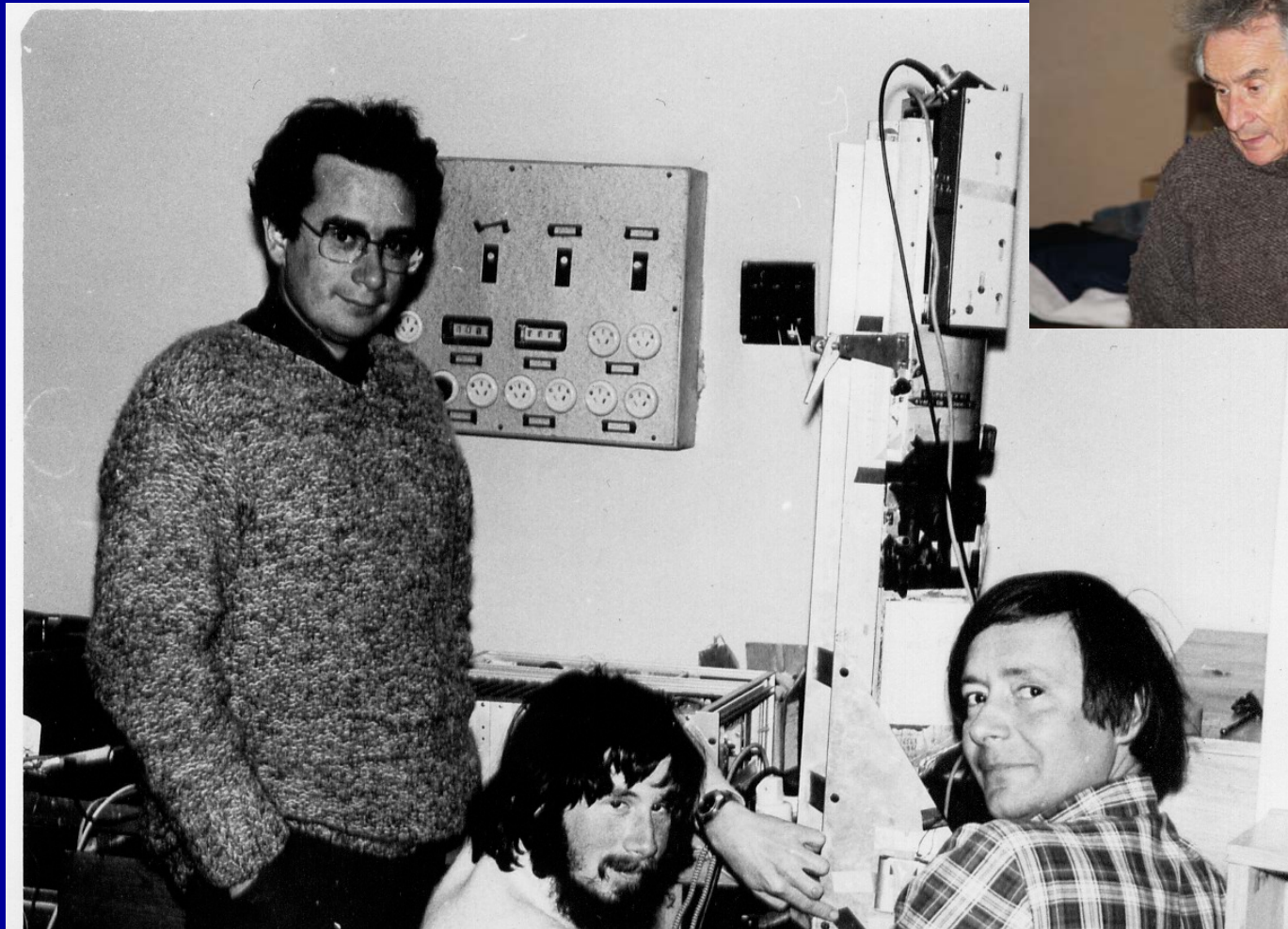




**6 m mirror
transportation to
the Lytkarino
optical factory
(May 2007)**



R.Foy, L.Koechlin and A.Labeyrie in the control room of the 6 m telescope (1977)



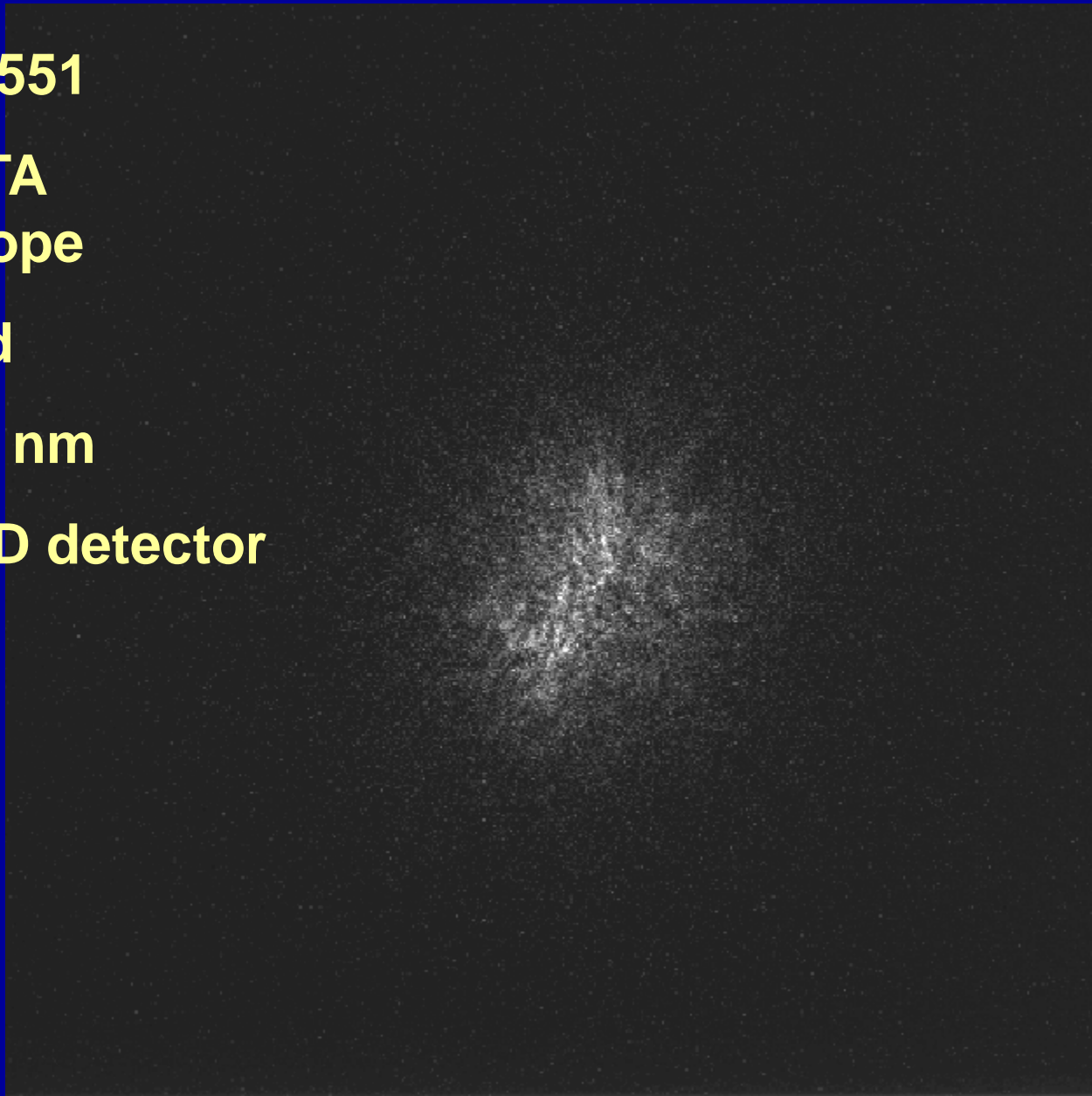
HIP 79551

**6 m BTA
telescope**

4" field

600/20 nm

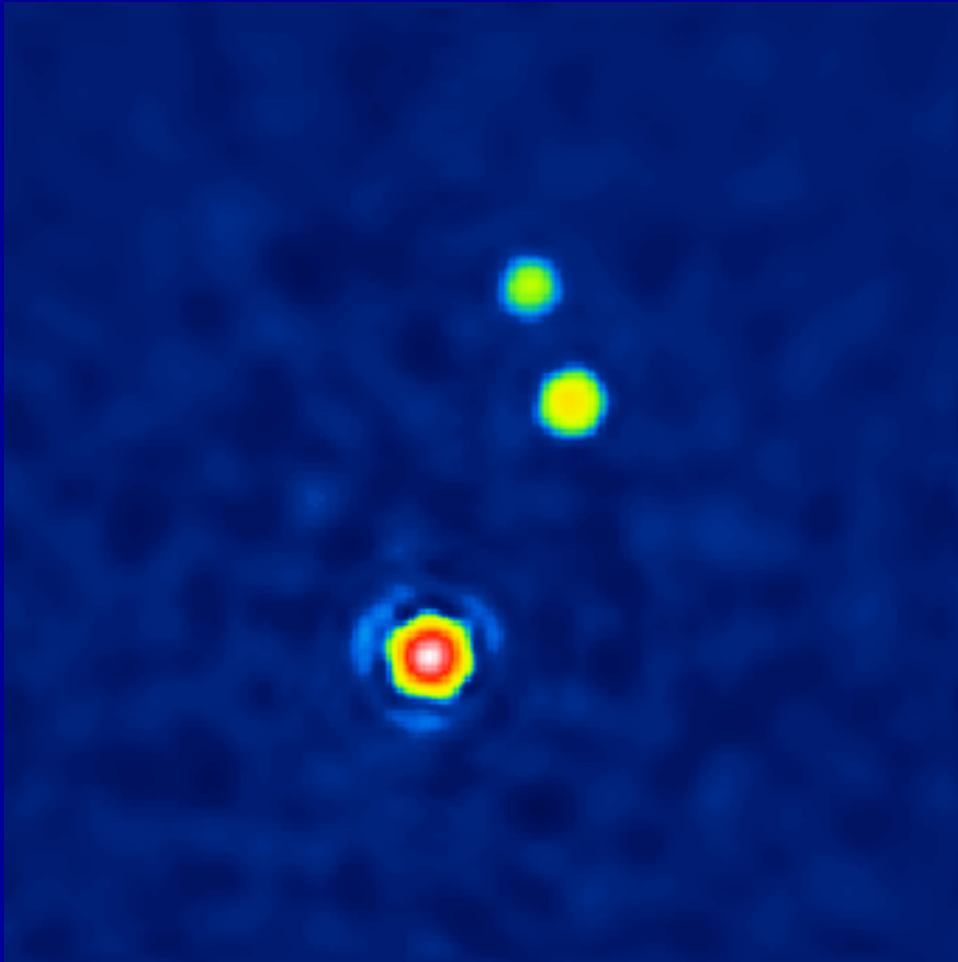
EMCCD detector



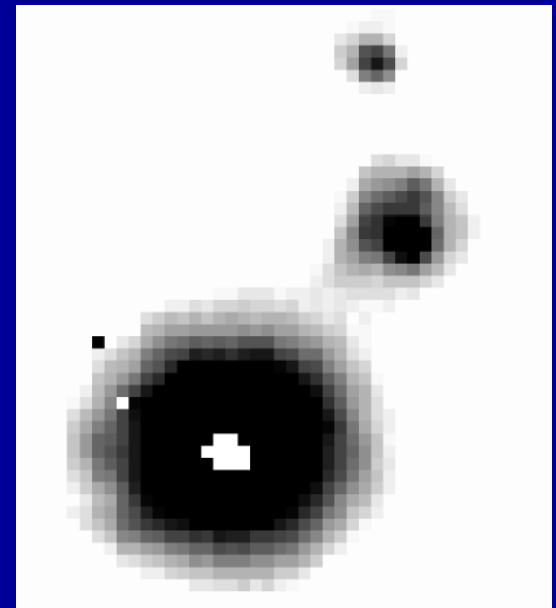
Targets

- Nearby low-mass stars – candidates for accurate masses
- Young intermediate-mass multiples in SFR
- Young massive stars in SFR
- Symbiotic stars
- Binaries with magnetic components
- Multiple systems with eclipsing binaries
- Population II multiples
- Peculiar stars

GJ 900 – a triple red dwarf

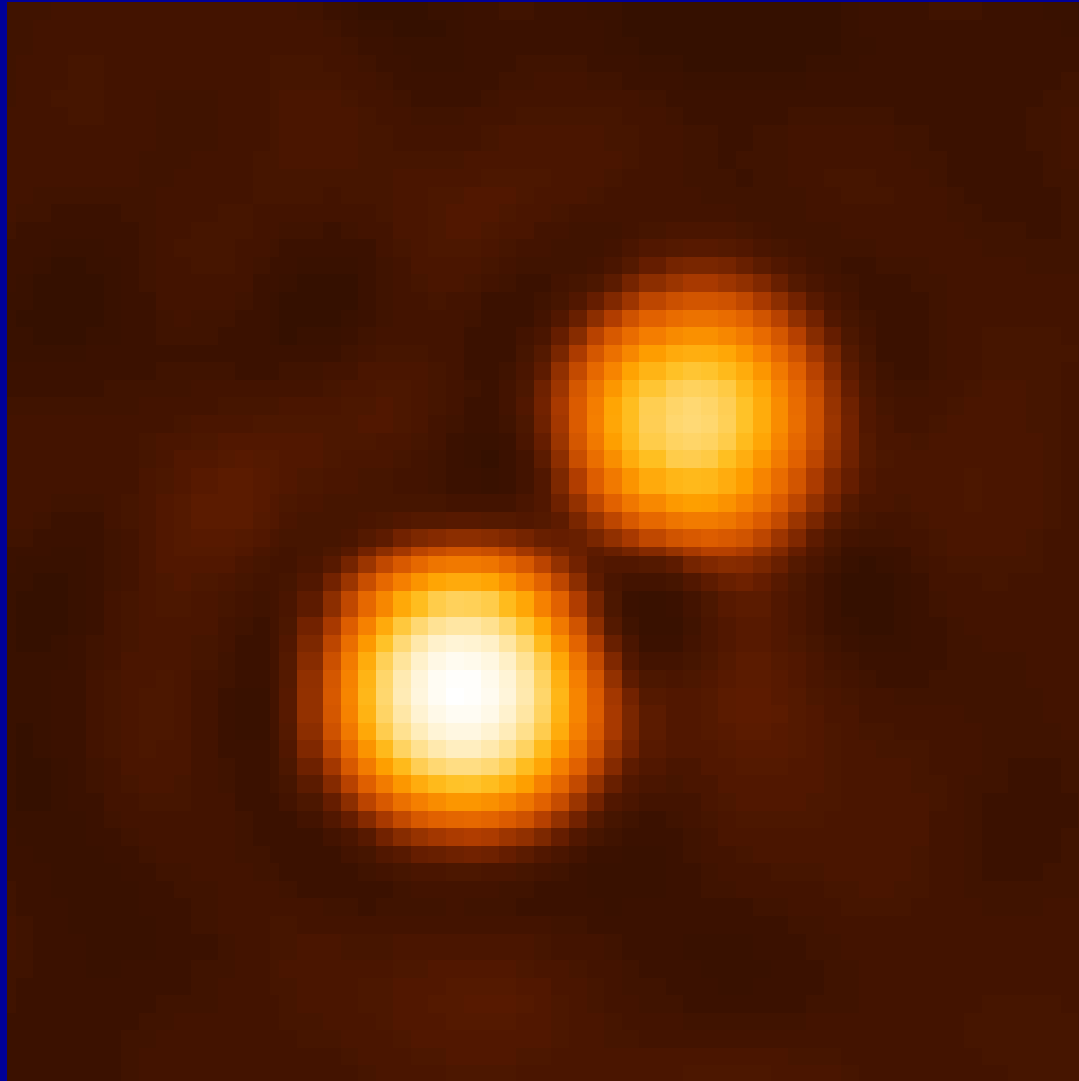


H-band speckle, BTA, 2003



H-band Keck AO
(Martin 2003)

Young multiple brown dwarf system GL569B



6 m telescope

March 2001, J-band

Sep. 89.9 mas (about
1 AU)

Orb. period 3.5 yr

Mass sum 0.140 M_{\odot}

GI 765.2

interferometric-
spectroscopic binary

K1V – K3V

$P = 11.919$ yrs

$e = 0.240$

$a = 189$ mas

$i = 89.2^\circ$

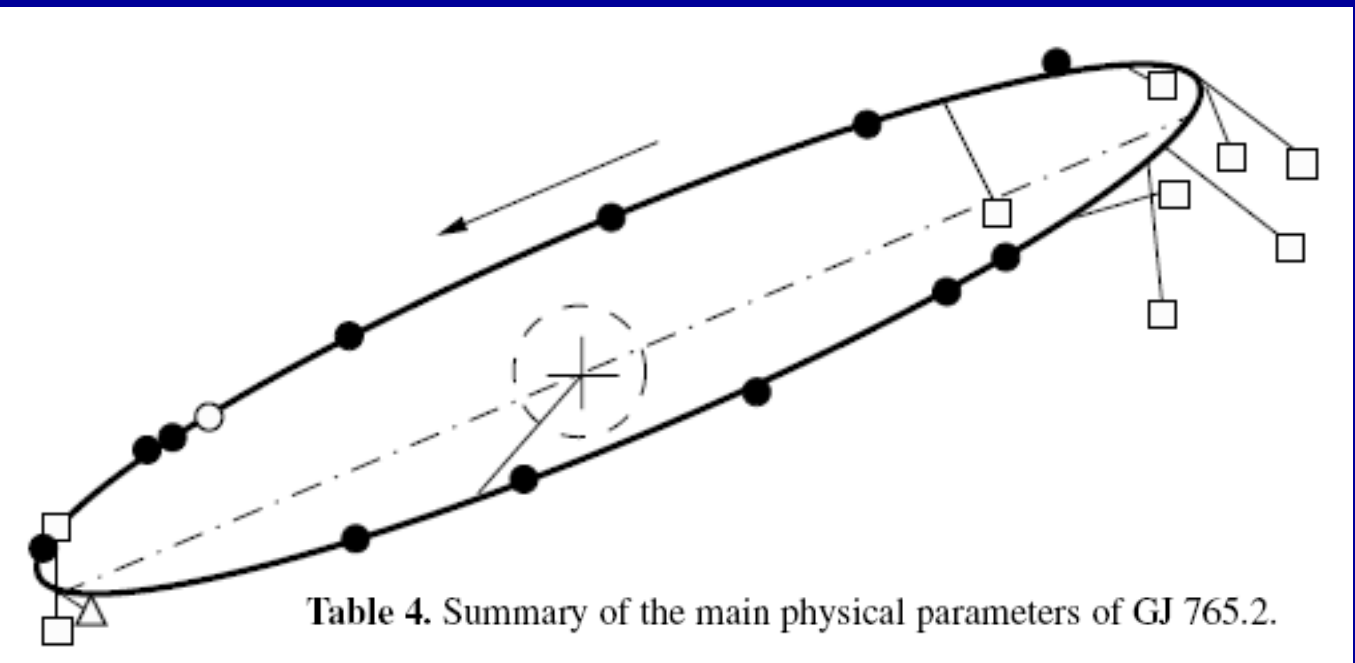
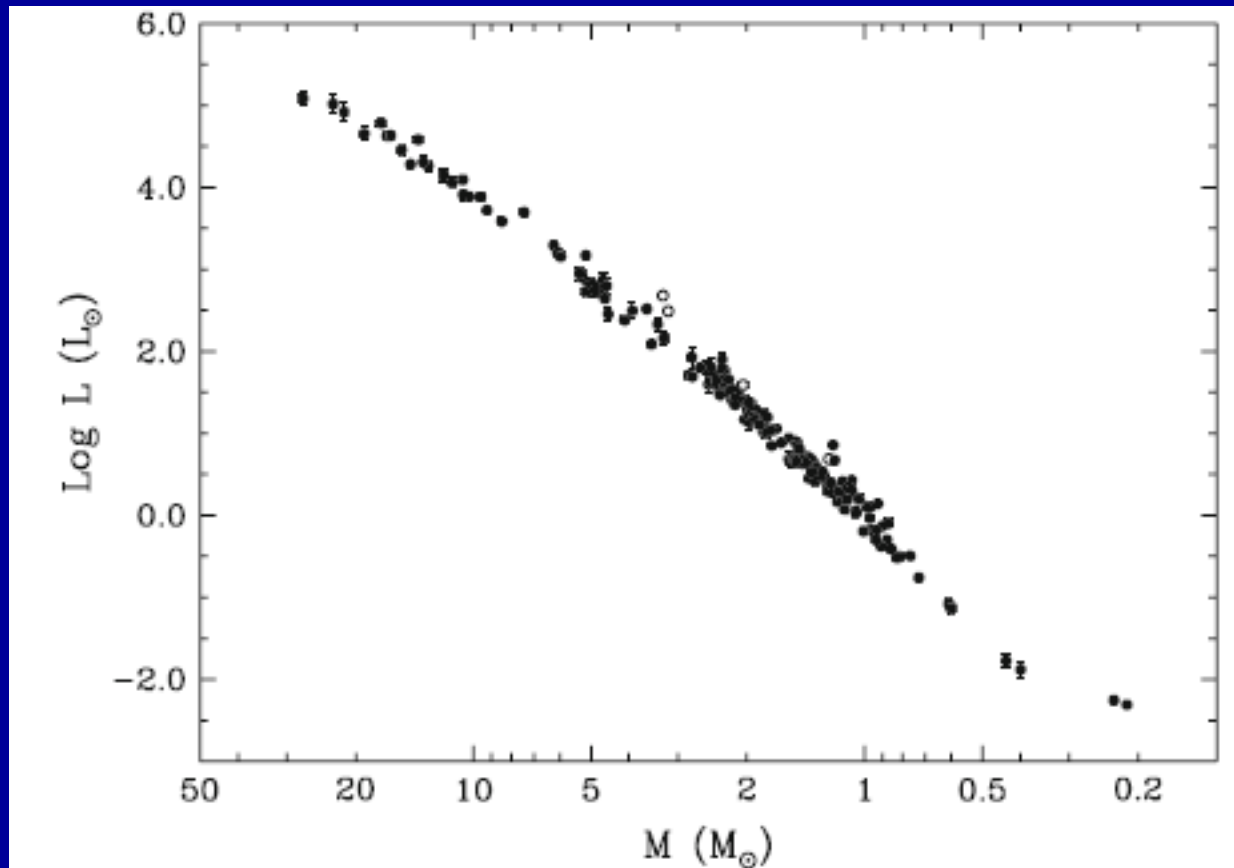


Table 4. Summary of the main physical parameters of GJ 765.2.

Parameter	Primary	Secondary
Mass (M_\odot)	0.831 ± 0.020	0.763 ± 0.019
$\log (M/M_\odot)$	-0.0804 ± 0.0104	-0.1175 ± 0.0108
m_V	8.54 ± 0.02	9.19 ± 0.04
M_V	5.99 ± 0.04	6.64 ± 0.05
L/L_\odot	0.40 ± 0.02	0.26 ± 0.02
M_{bol}	5.71 ± 0.05	6.17 ± 0.06
J magnitude	4.40 ± 0.09	4.94 ± 0.22
K magnitude	3.92 ± 0.09	4.34 ± 0.22
$(V - K)$	2.07 ± 0.10	2.30 ± 0.23
$(J - K)$	0.48 ± 0.13	0.60 ± 0.32
T_{eff} (K)	5060 ± 130	4690 ± 160
$\log T_{eff}$	3.702 ± 0.011	3.670 ± 0.015
Spectral type	K1V	K3V
[M/H]	-0.35 ± 0.15	

Accurate masses and luminosities of normal stars

(Torres and Andersen 2009)

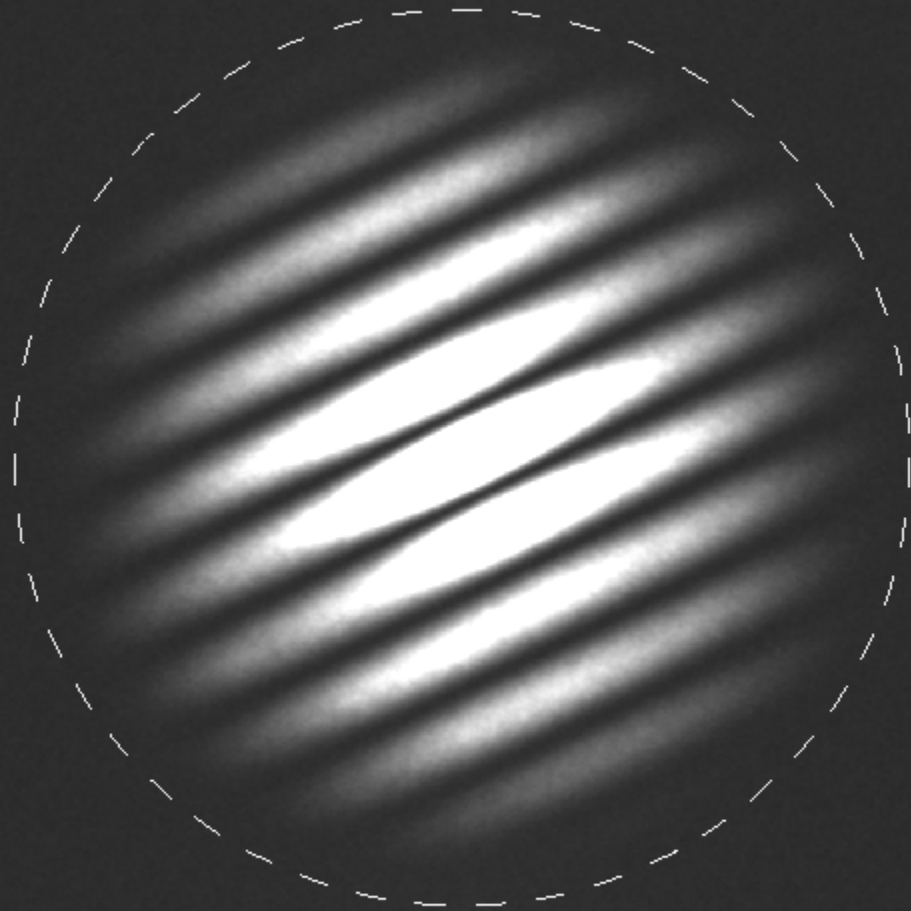


HIP 26034

New B9V binary in
Cas-Tau association

BTA speckle
interferometry in
Dec. 2008, 550 nm

$\rho = 94$ mas



BTA speckle interferometry of 83 stars in Cas-Tau association: new resolved pairs

HIP	rho	err	theta	err	dm1	err
10944	0.107	0.001	154.6	0.6	2.03	0.02
13330	1.448	0.004	338.5	0.3	4.90	0.09
15627	0.863	0.002	219.4	0.3	2.66	0.01
19720	0.030	0.008	52.8	4.9		
21135	0.525	0.002	103.3	0.3	4.34	0.09
2377	0.296	0.002	288.9	0.4	2.43	0.02
24836	0.020	0.001	110.2	1.4		
2505	0.283	0.001	205.3	0.5	0.20	0.01
25499	0.105	0.001	87.7	0.3	0.95	0.01
25695A	1.781	0.006	87.7	0.3	>4	
25695B	0.991	0.003	134.0	0.3	4.04	0.02
26034	0.095	0.001	85.1	0.3	0.15	0.01
26640	0.542	0.002	136.6	0.3	4.06	0.03
27723	0.764	0.001	162.8	0.3	1.01	0.01
8108	0.020	0.001	266.5	1.7	0.13	0.10
8551	0.091	0.003	245.1	2.0	2.85	0.08

epoch 2007.98

Ratio S:B:T:Qua:Oui = 48:30:3:1:1

V 379 Cep

Eclipsing quadruple

Algol type

Aa+Ab 100 d

Ba+Bb 159 d

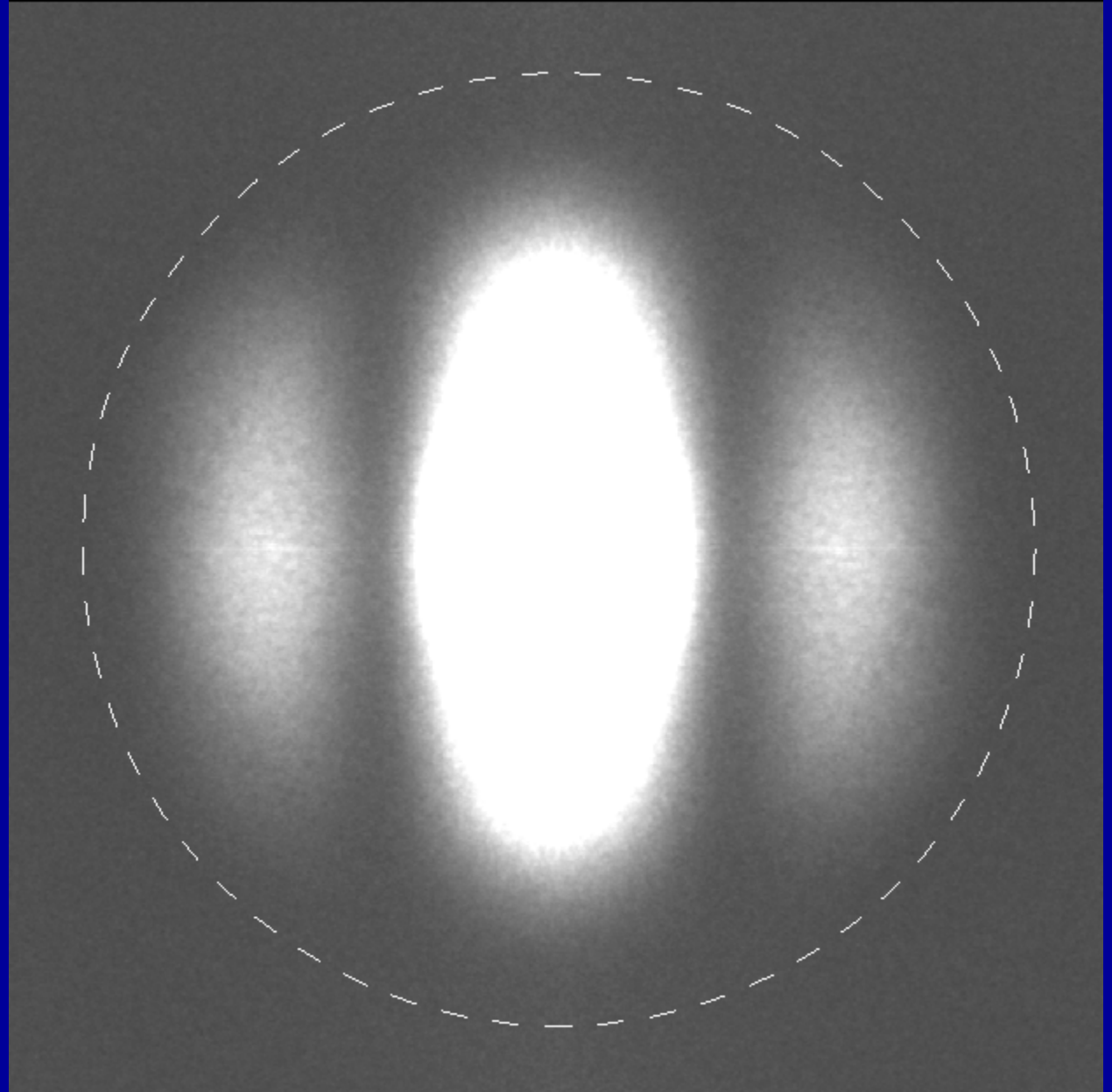
A+B ~ 7800 d

BTA speckle
interferometry in
Nov. 2009

$\rho = 20$ mas

(550 nm)

Prob. orbital period
is 7800 d.



V 649 Cas

B0Vn star at 500 pc

Eclipsing binary 2,4 d

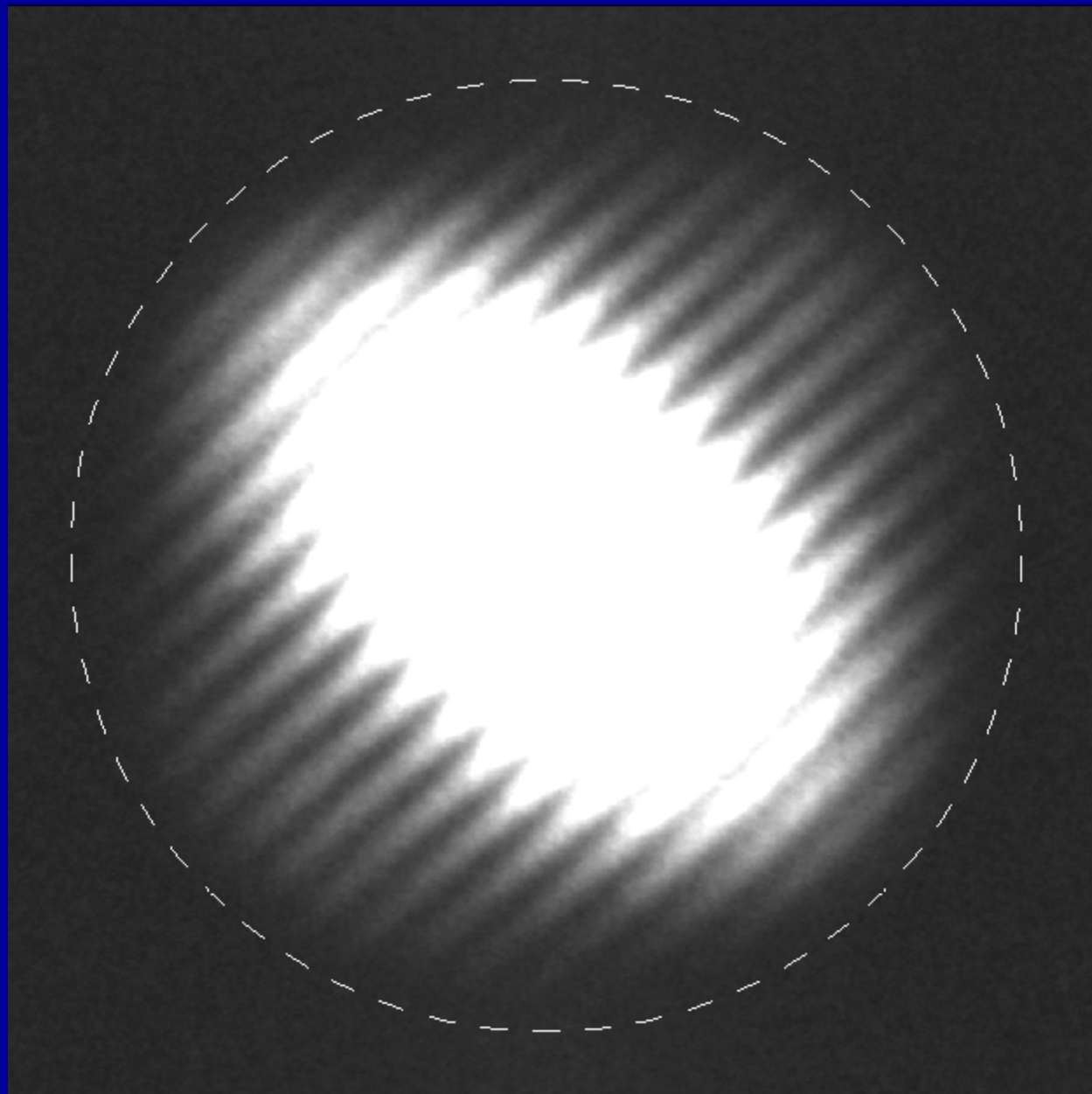
Triple (quadruple?)
star:

$\rho = 16 \text{ mas}$

$\rho = 176 \text{ mas}$

($\Delta m \sim 2$ at 550 nm)

BTA observations in
Nov. 2009



CH Cyg, BTA 2004: $\rho=0''.042$, $\theta=24,6^\circ$,

$\Delta m=2.2$ at 550 nm





G89-14

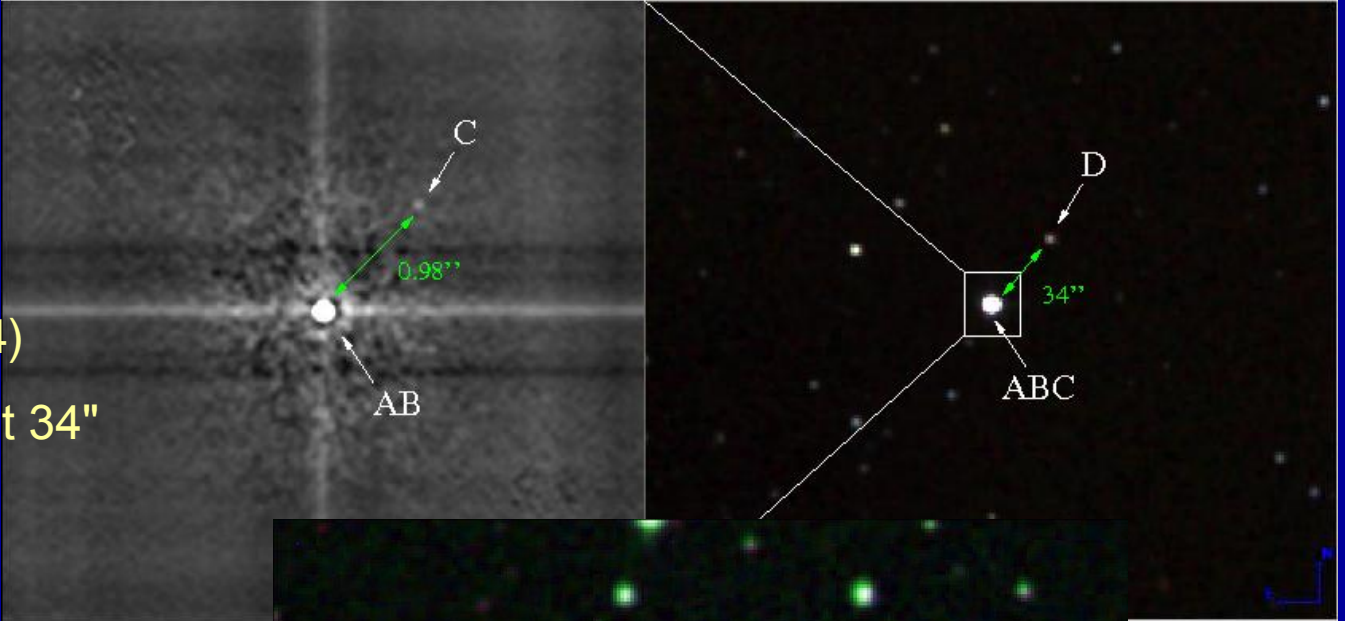
Sub-dwarf quadruple system:

AB 180 d. (Carney 1994)

AB-D cpm-companion at 34"

(Allen 200)

([Fe/H] = -1.9



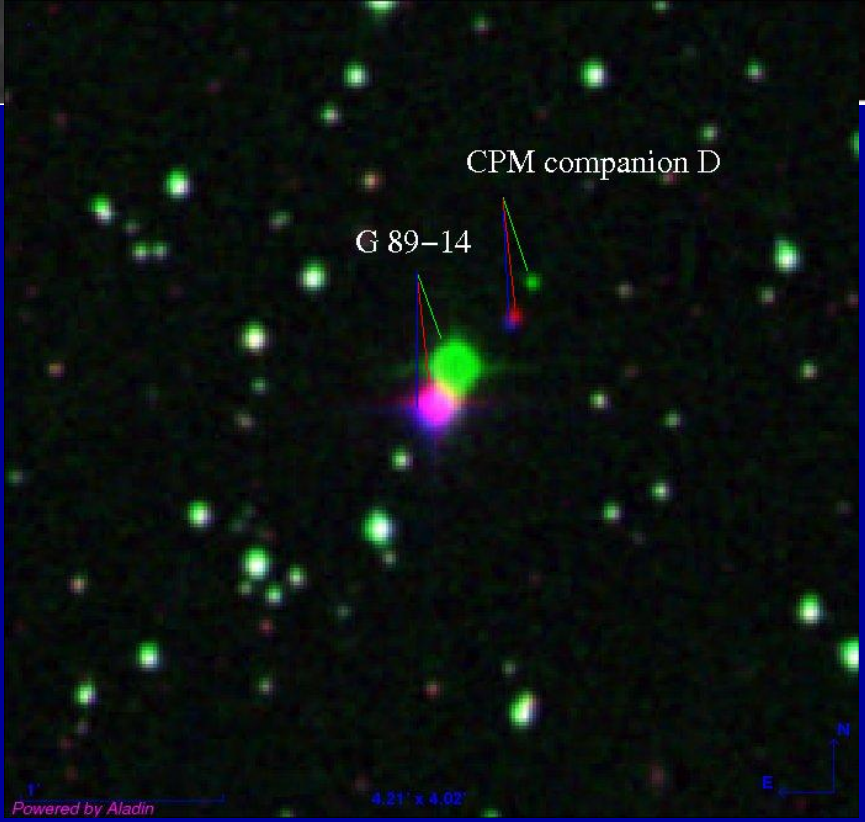
BTA speckle interferometry:

comp. C at 0.98"

$\Delta m(AB-C) = 4.5$

Mass estimates (A,B,C,D):

0.67M, 0.24M, 0.33M, 0.22M



Powered by Aladin

SPECKLE SURVEY OF HALO AND THICK DISK STARS with $[m/H] < -1.5$

From the sample of 223 nearby (<250 pc) Pop II stars (limiting magn. 14):

- 5 new binaries (G191-55, G114-25, G142-44, G28-43, G130-7), 3 triples (G87-47, G111-38, G190-10), 1 quadruple (G89-14)
- Ratio S:B:T:Q = 147:64:9:1
- Orbital period distribution has maximum at $P=10^2 - 10^3$ d
- Mass ratio distribution is \sim flat with $q = 0.2 - 1$

HD 103498 = 65 Uma D

**strong magnetic field
star**

BTA speckle
interferometry

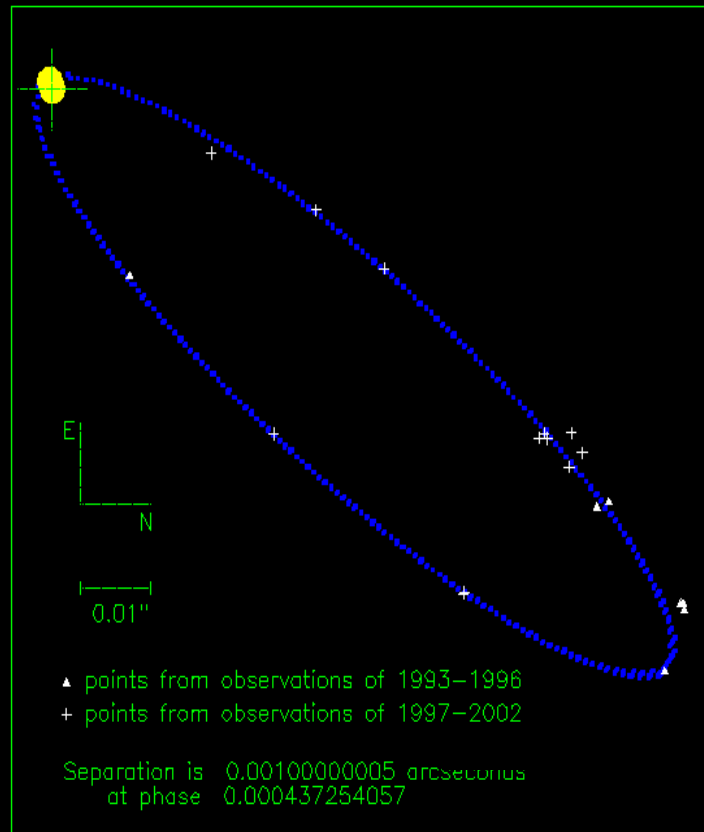
Dec. 2009

800 nm filter

$\rho = 150$ mas



Interferometric orbit of 41 Draconis



$P=3.41330$ yr
 $T_0=2001.41229$
 $e=0.9754$
 $a=71$ mas
 $i=49.7$
 $M_1=1.28 M_\odot$
 $M_2=1.20 M_\odot$
 $\pi=23$ mas