Employing VO Standards in Handling Proprietary Stellar Data

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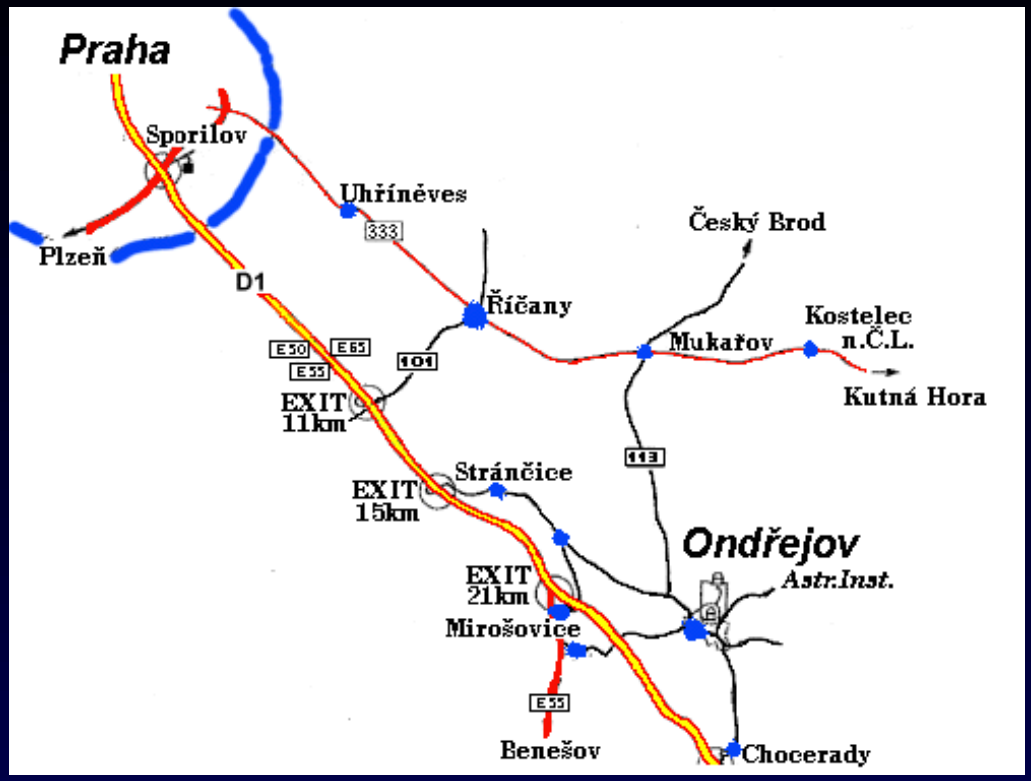
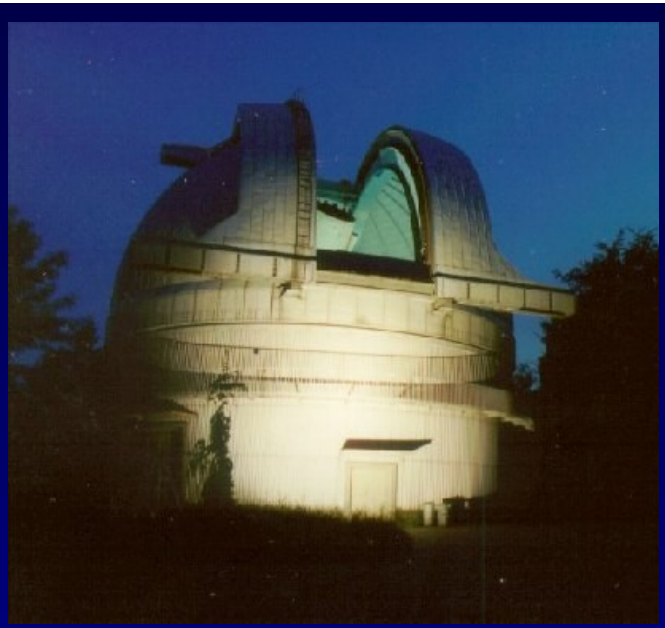
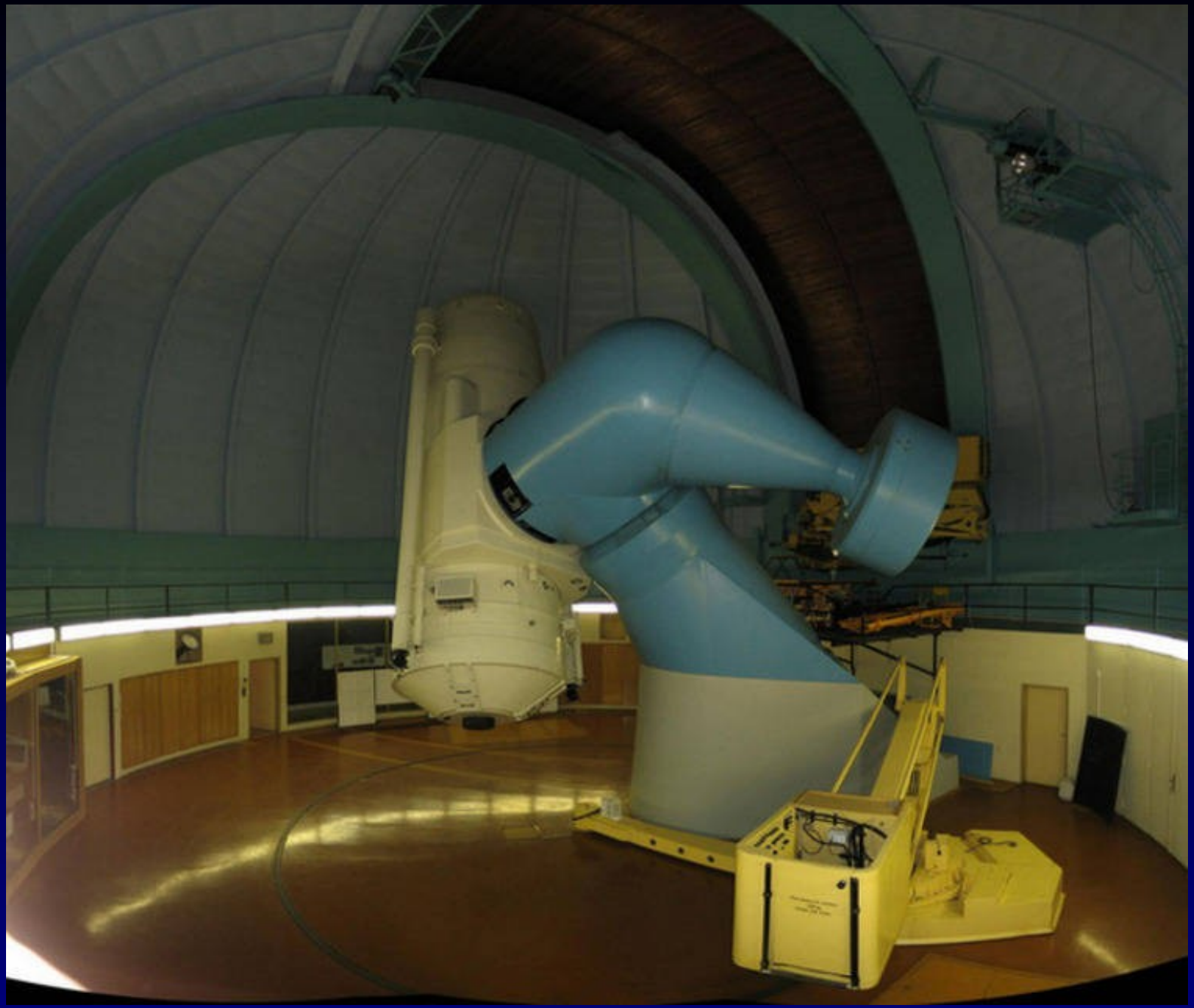
CoSADIE Astronomical Data Center Forum
Heidelberg, Germany, 11th June 2013

Ondřejov observatory





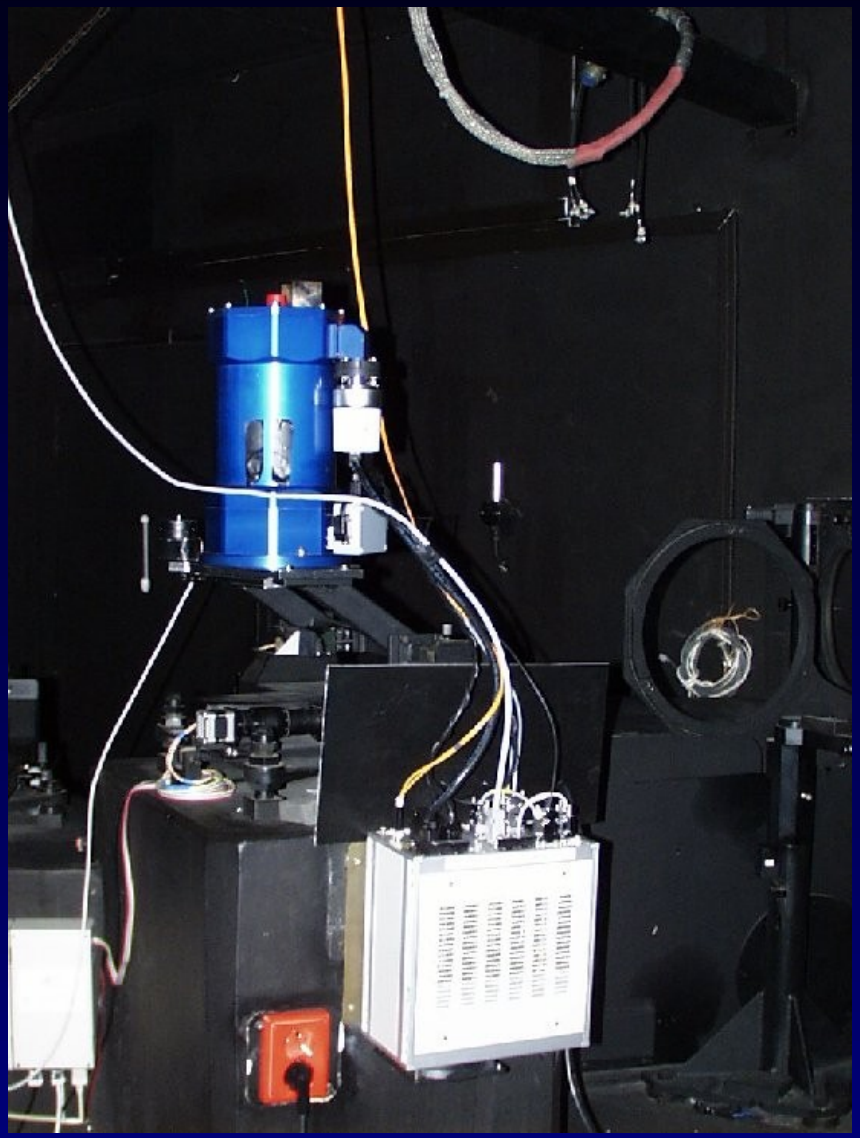
2m telescope panorama

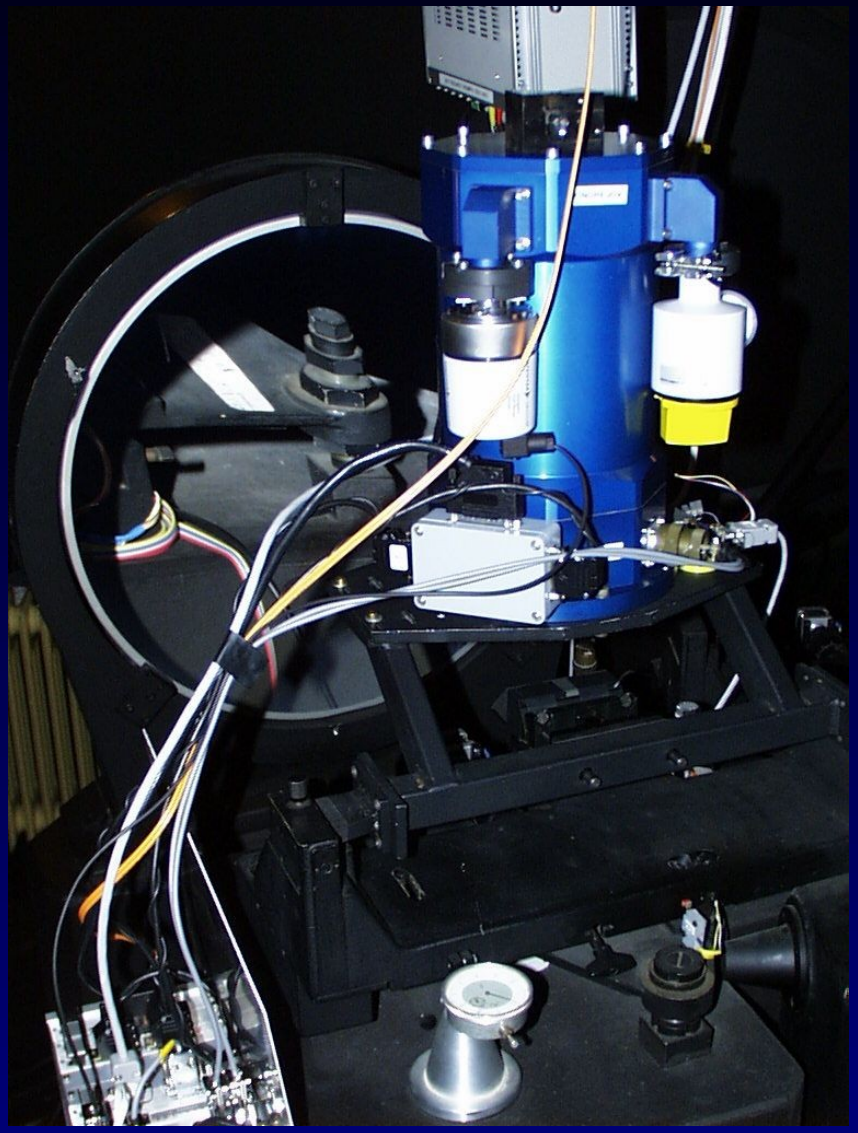


Coudé room

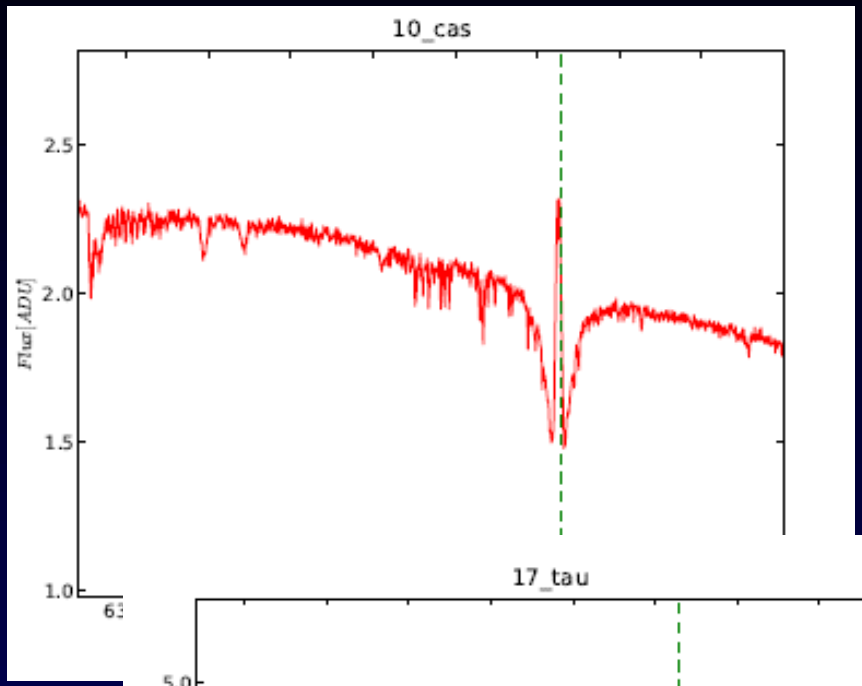
Camera 700mm

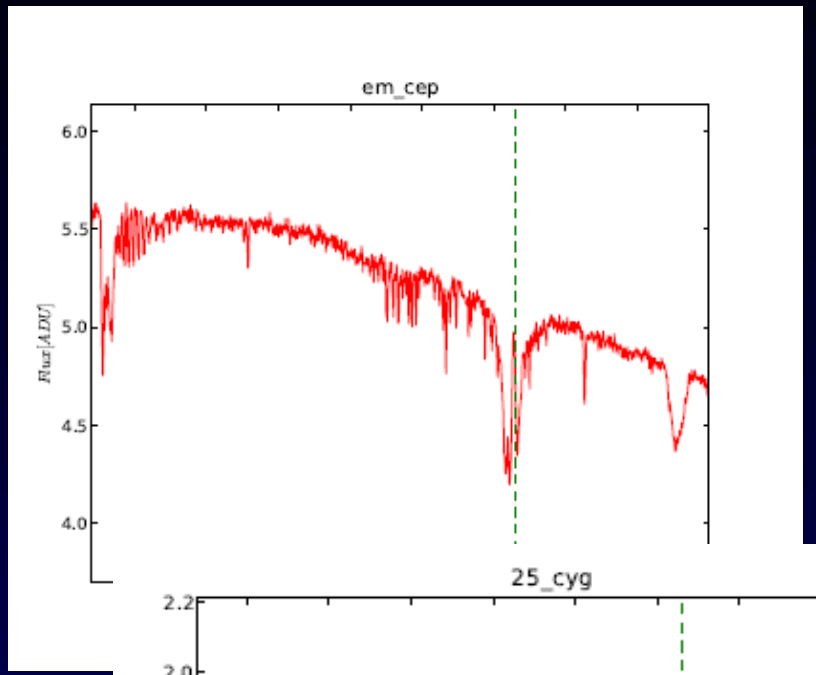
SITe 2000x800 15um
R~13000 6300-6700A

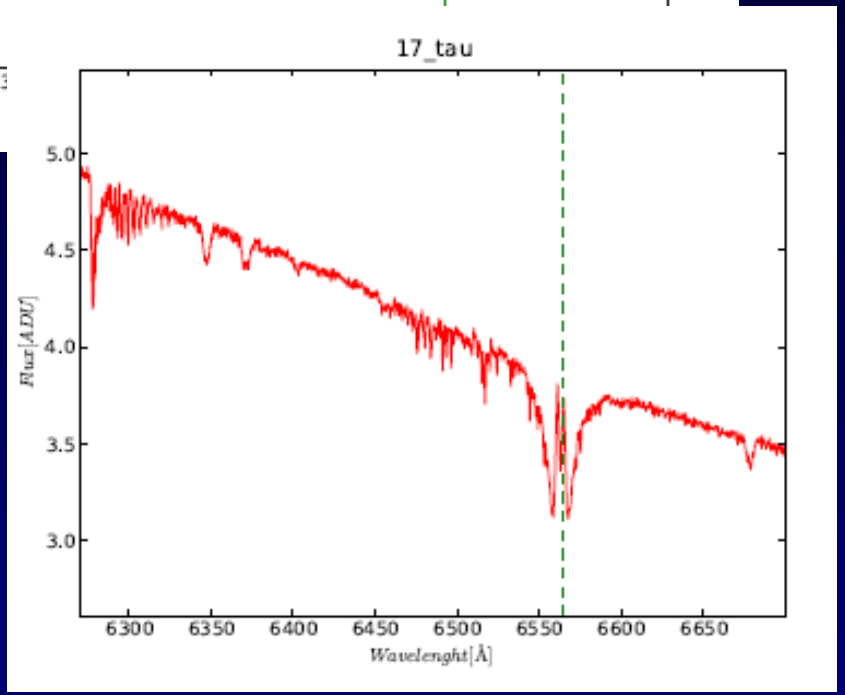


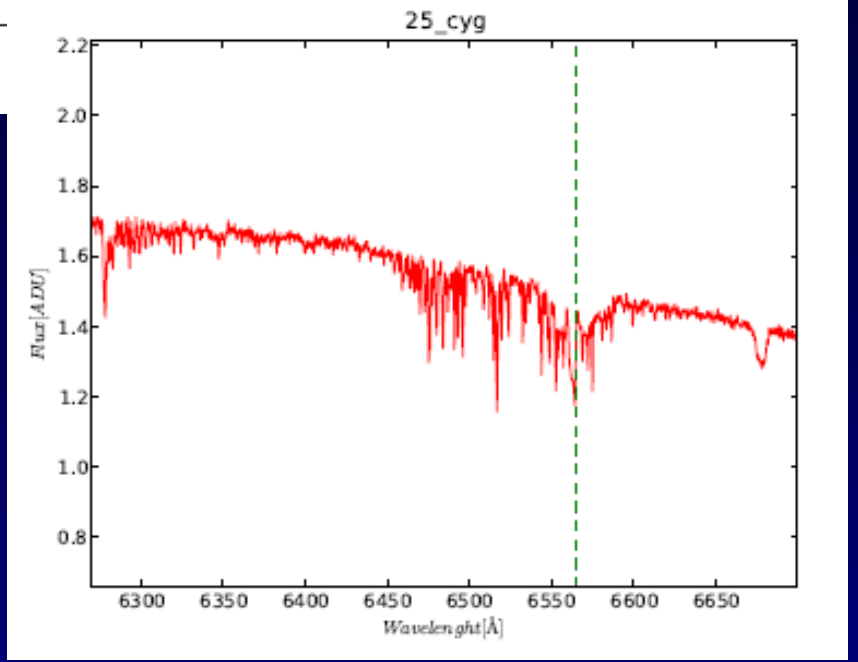


Be Stars : Emission in absorption









Observational and Reduction (CCD700)

- Formal proposals just started
- Observing „duty“ - 1 astronomer + 1 operator
- Sharing time - „service“ for colleagues
- PI and proposal ID not so far in FITS
- RAW spectra reduced in pipeline-like way
  - By one person - goes to „public“
  - Rereduced by PIs – private .. no will to homogenize
- Core metadata = OBSERVER (who reduced ?)

NEED FOR CURATION and PROVENANCE

published in DaCHS 2012 (Peterka)

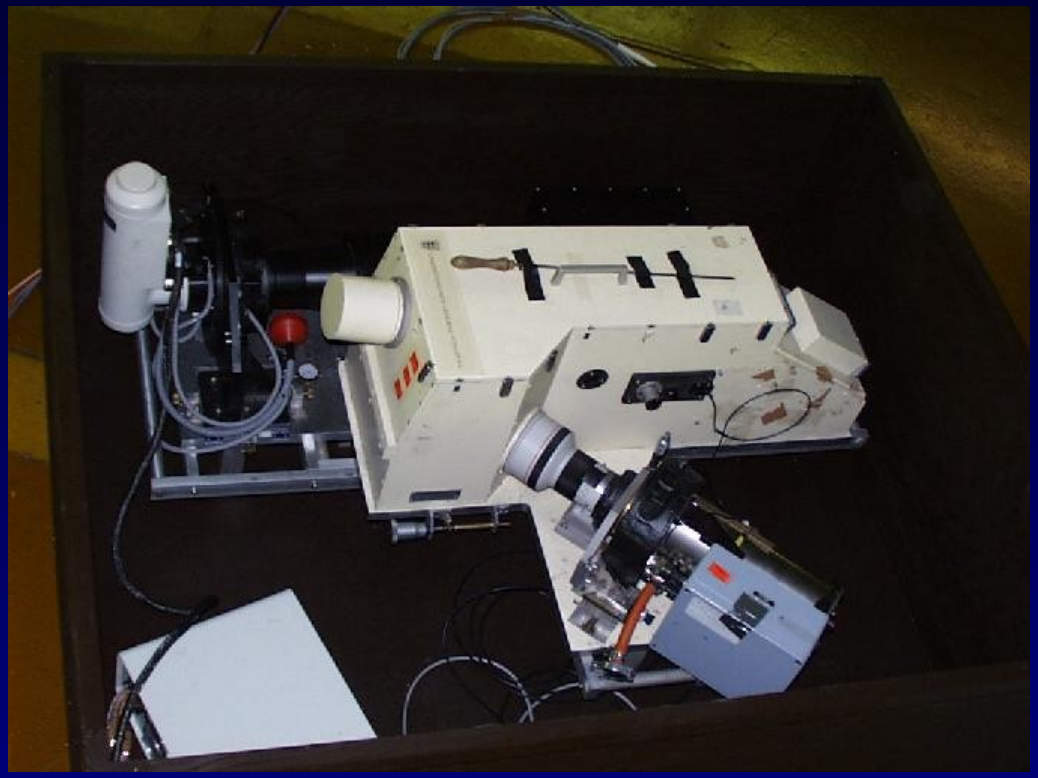
on the fly normalization + cutouts

HEROS (2000-2003)

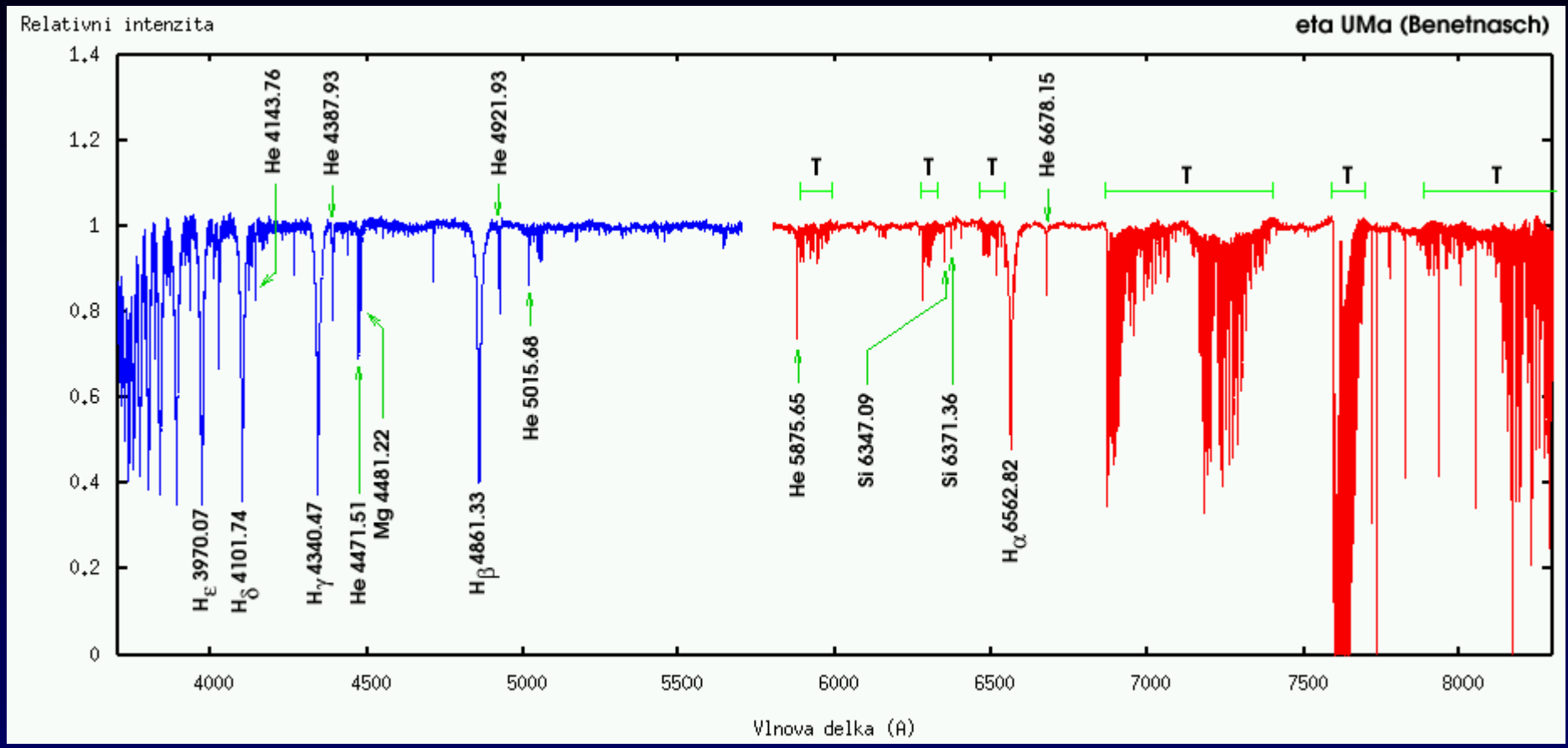
Two channels , R~50000 3700-8500 A,

Finished – reduced and archived – public since 2008 (EURO-VO DCA WP6)
SSAP Cutout prototype (Pleinpot)
FLUXCALIB=normalized (separate file)

in DaCHS – 2012 (T. Peterka + M.D.)



Typical Pipeline Output



HEROS – 2 channels (gaps), order merged, rebinned, normalized

Data Access Policy (for CCD700)

- Difficult to convince people to publish data
  - its MY DATA !!
- Proprietary period – fuzzy and long
  - N years after finishing PROJECT ....
  - After publication (long term monitoring – 10s years)
  - Some observatories do not think about it at all
- VO is about PUBLIC ACCESS for ALL ???
  - I do not care – I do not want publish
  - Its not my job – I have to write articles
  - Why should we loose time and manpower to do it ?
  - If required (journal) – I cut only published sp. lines

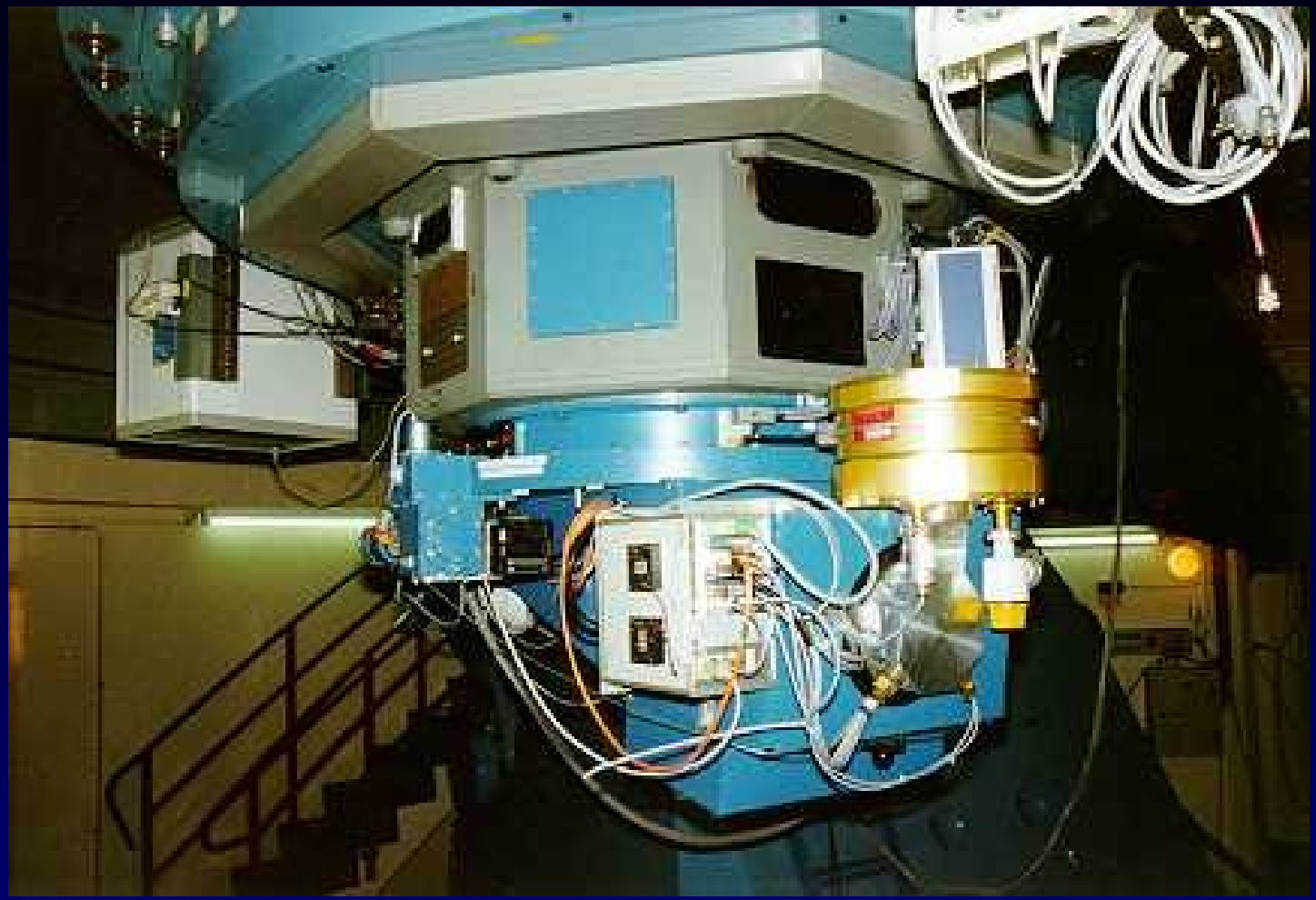
Using VO Tools – ignoring VO

- Aladin – viewer over WWW
- Vizier over WWW
- Java tools ? No webstart – blocked
- SPLAT-VO – local files for ANALYSIS
- CASJobs – advanced users
- Ignorance of VO by large fraction of stellar astronomers:
  - My data are not in VO
  - Few stellar spectra archives in VO
    - ESO UVES .. old, FEROS – not recent,
    - DAO – not SSA
    - BeSS– mainly amateurs, confusing –echelle orders

Danish 1.54m at La Silla robotized in Summer 2012

Danish 1.54m Telescope

DFOSC at 1.54m



Camera CCD

2048x2048 (cut 4k)

13.5x13.5 arcmin

filters U,B,V,R,I
Halpha, Hbeta ...

3 groups of Czech astronomers

October-April time

Remote observing

OSPS (Ondrejov Southern Photometry Survey) – use unused part (99%) of data
lightcurves on the click .... Updating after recalibration

How to get them involved in VO

- Promise to increase the productivity
- Private data TOGETHER with public (VO client)
  - Comparison, X-matching, Theoretical + observed
- ==> LOCAL data in VO clients
  - Need for RESTRICTED ACCESS
- Authentication in SPLAT, Aladin, TOPCAT needed !!!!
- Spectra CC700 – individual objects/date - embargo
- Images od DK154 – in SIAP allowed if degraded
  - PNG compressed, nonlinear intensity, 3x3 pixels bin
  - Troubles with metadata – coordinates, time (exoplanets..)
- Light curves (SSAP, TAP) photometry points ????
  - Locking table records... (by ID, ??, SSAP sources?)

OSPS Technology - Processing

RAW frames + calibration

- approx. pointing - RA,DEC by TCS = rough WCS
- filter name
- image type (LIGHT, (sky)FLAT, BIAS)
- FITS image 2048x2048x32 bit (20bit ADC) – 17MB

PROCESSED frames (in VO-Munipack)

- PHDU – flatfielded + bias subtracted image (Float)
  - metadata – dateobs, HJD, filter

→ object extraction (by PSF) →

- BINTABLE extension – object coords (x,y, 12x apert)

→ astrometry (using UCAC4 called by conesearch) →

- UPDATED WCS in PHDU + UCAC4 matched+ errors

OSPS Technology Calibration, Ingestion+X-matching

CALIBRATED frames (in VO-Munipack)

- PHDU – flatfielded + bias subtracted image (Float)
  - metadata – dateobs, HJD, filter, WCS – footprint
    - → transformations (filter profile), conversions →
- BINTABLE extension – obj. cat. (RA,Dec,flux, mag...)

DaCHS ingestion – several tables (+obscore)

- Images (raw, calibrated) – metadata + accref
  - → conversion to degraded PNG preview + WCS
- photometric points – coords (small spread), filter,HJD
- X-matching with ppmxl – reference coordinates
  - → ObjectID

OSPS Technology - Publishing

RAW frames in SIAP

(authentication for FITS, free PNG)

CALIBRATED IMAGE in SIAP

(FITS contains the bintable extension with source cat)

BINTABLE extension

SCS(+query by filter,time)

TAP (advanced query in ADQL)

SSAP LIGHTCURVE (constructed on the fly by objID)

OSPS Technology - Consuming

Aladin (SIAP, SCS) Image+catalogue in 1file

TOPCAT (TAP, SCS .... SSAP activation)

SPLAT-VO (direct name resolution)

web form

SAMP

(still limits – e.g. LC of list of stars, multicolor LCs, click on star in Aladin to see LC)

VO is used in whole survey as integral part of SW

OSPS Light Curve Generation

http://vos2.asu.cas.cz/extract/q/getspec/custom/lightcurve.fits?
LANG=ADQL&REQUEST=doQuery&FORMAT=fits&
QUERY=select+*+from+bextract.objobs+where+sourceid+='6667
217533313055071'+and+band='V'+and+mag<99+
order+by+hjd

More details in Bachelor Theses of Jiří Nádvorník and DariaMikhailova, Faculty of Information Technology, Czech Technical University, Prague 2013

http://dip.felk.cvut.cz/browse/pdfcache/nadvoji1_2013bach.pdf

http://dip.felk.cvut.cz/browse/pdfcache/mikhadar_2013bach.pdf

DEMO