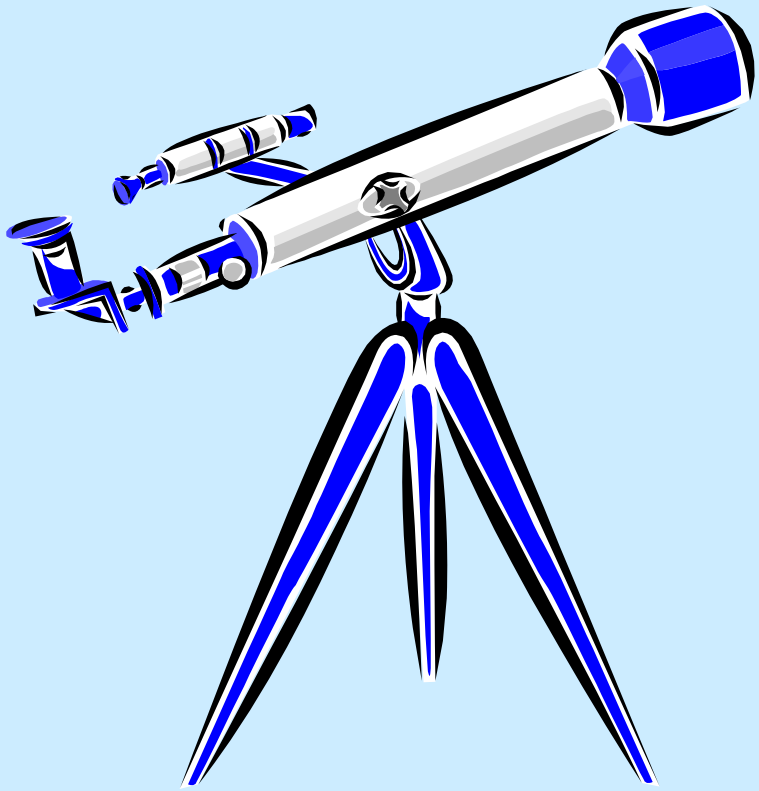
ASTRONOMY

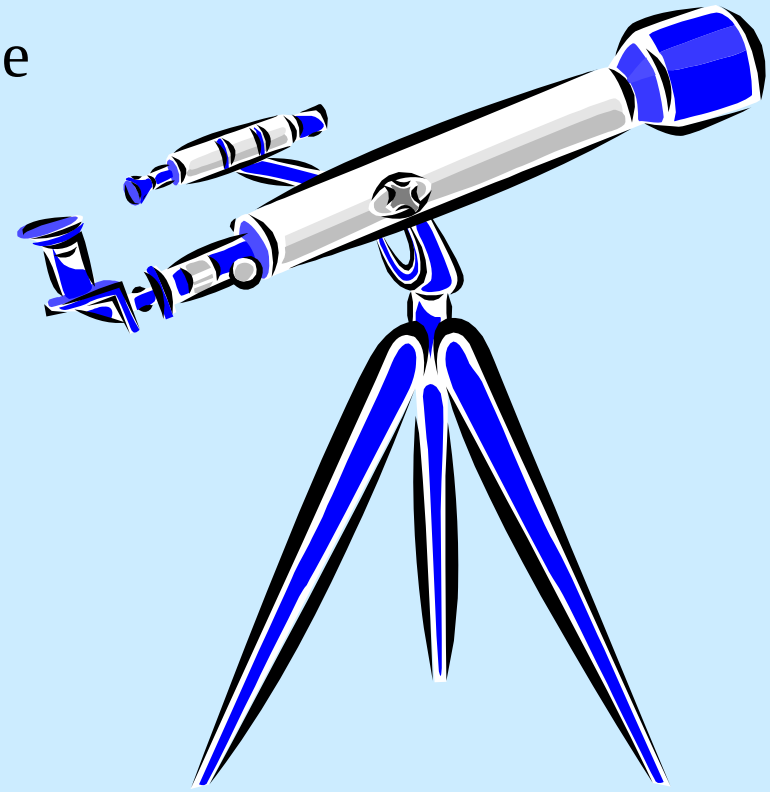


IN CLASS

Wim Cuppens

For what students?

- students in 5th year ➔ 17 years old
- students who choose for science
- 2 hours / week , 18 weeks
- 2 groups of ± 15 students



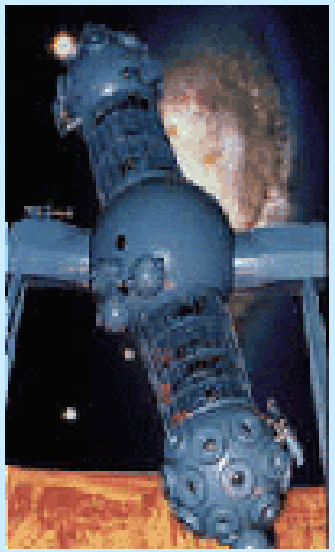
What did we do ?

Part 1

General astronomy

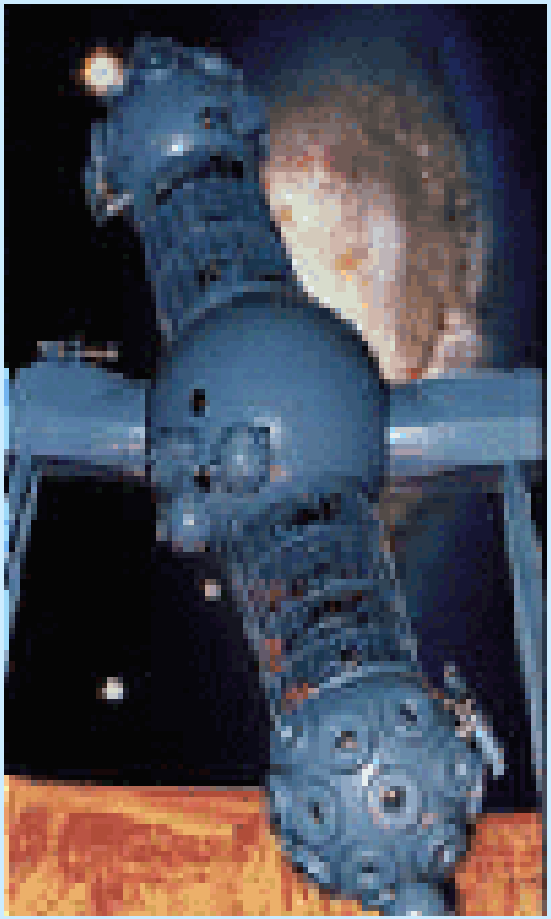
Introduction with “Skyglobe”

Visit to a planetarium



Observation night

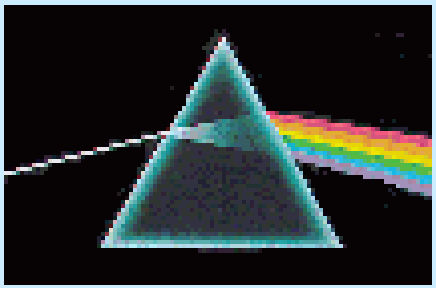
Planetarium visit



Observation night

What did we see?

→ constellations
→ Moon
→ Saturn
→ Comet Macholz
→ Galaxies, nebulae,…



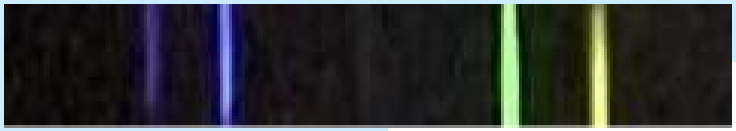
Part 2

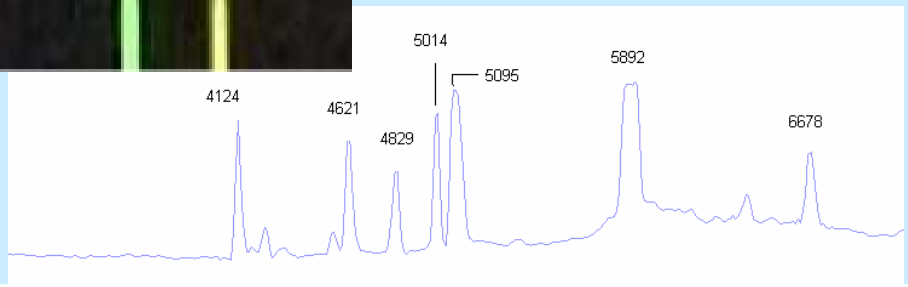
General spectroscopy

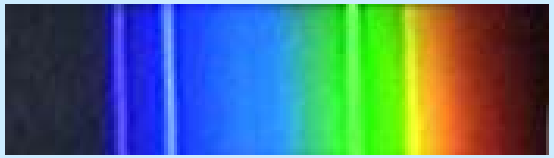
Making of a scientific poster about “what is light”

Making of a simple spectroscope

Looking at different light sources







Part 3

Photography

- making of a “pinhole-camera”
- developing the b-w negatives
- making the photos
- introduction in digital photography → CCD camera

Part 4

Spectroscopy in Astronomy

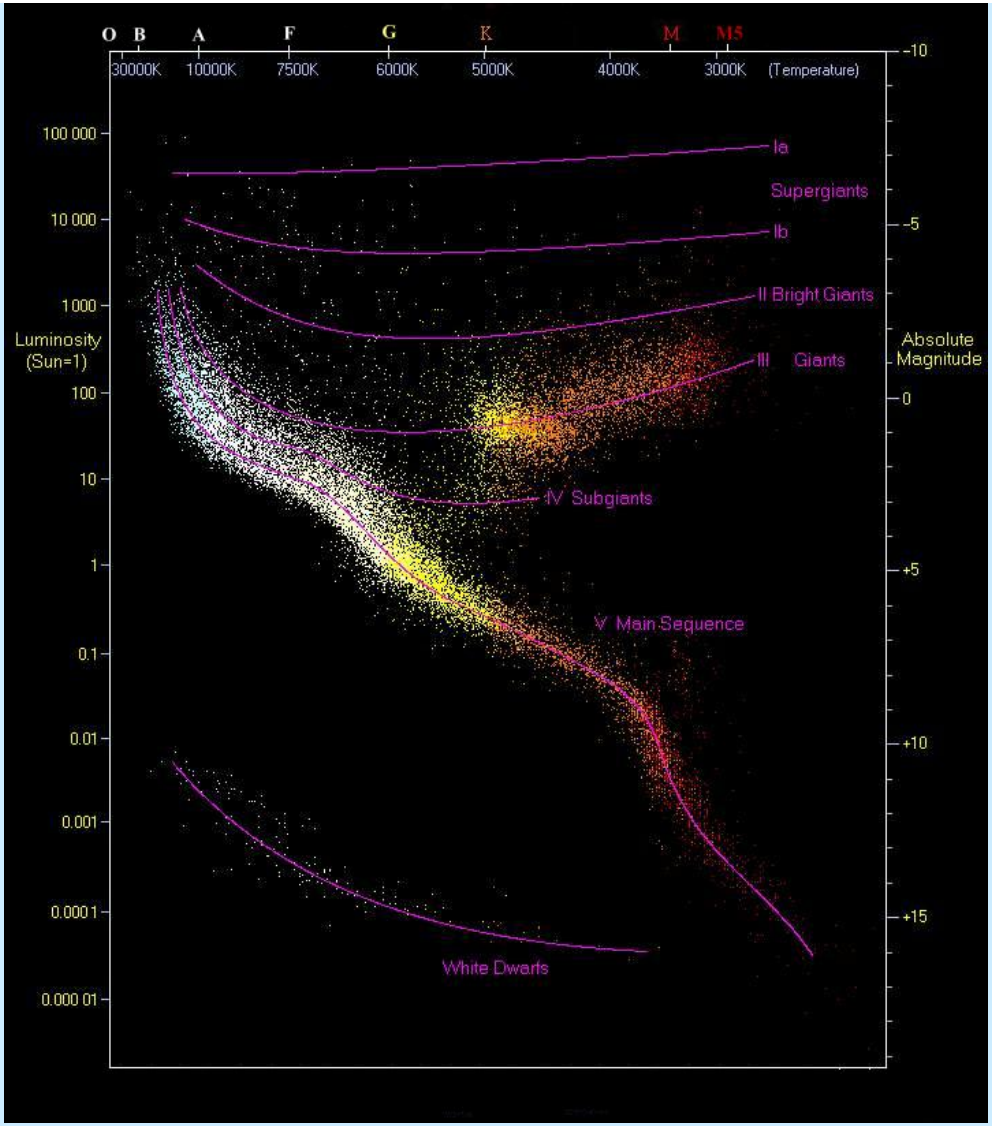
→ Spectral class of stars out of the spectra of stars

O – B – A – F – G – K – M

“Oh Be A Fine Girl, Kiss Me”

“Osama Bin Airlines, Flies Great, Knows Manhattan”

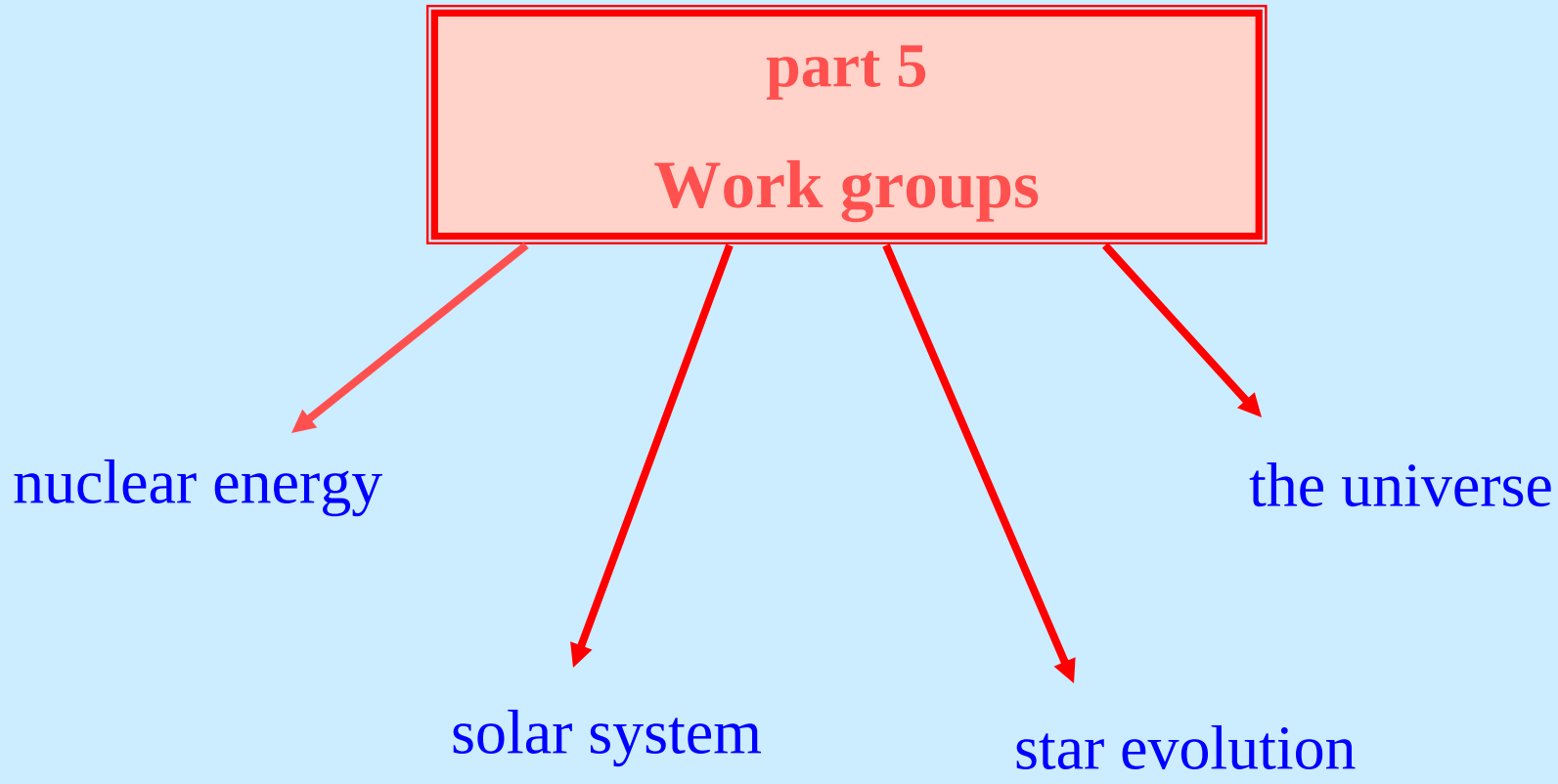
→ Properties out of the Hertzsprung-Russell diagram



Determine luminosity,

temperature, distance,
mass,… out of HR-diagram

Naam Ster	Relatieve Magnitude *m*	Spectr. Type	Absolute Magnitude *M*	Lichtsterkte L / L_{zon}	Lichtsterkte *L* (Watt)	Lichtsterkte per oppervlakte (Watt/m2)	Oppervlakte Temperatuur *T* (K)	Afstand *d* (parsec)	Afstand *D* (lichtjaar)	Afstand *D* (lichtjaar) LITERATUUR	Massa *M* (kg)	Massa M / M_{zon}
Altair	**0,8**	**A7**	2,0	50	1,9E+28	2,6E+08	8200	5,8	19	**16**	6,1E+30	3,1
α Gem	**1,6**	**A1**	1,0	60	2,3E+28	4,6E+08	9500	13,2	43	**49**	6,4E+30	3,2
Spica	**1,0**	**B1**	-3,5	4500	1,7E+30	1,4E+10	22300	79,4	259	**220**	2,2E+31	11,1
Alkaid	**1,9**	**B3**	-1,0	800	3,1E+29	8,2E+09	19500	38,0	124	**101**	1,3E+31	6,8


part 5
Work groups
nuclear energy
solar system
star evolution
the universe

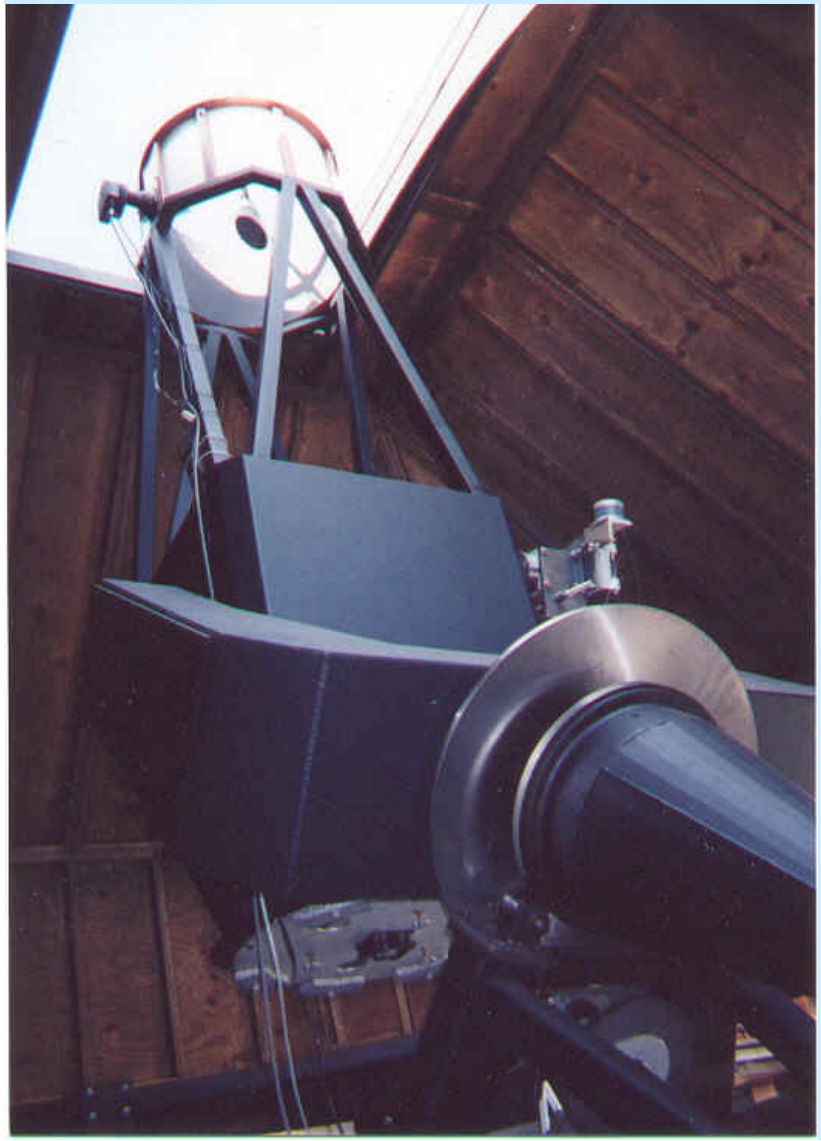
The universe

- What happened after the big bang ? Timeline
- Determine the Hubble-constant with CLEA
  http://www.gettysburg.edu/academics/physics/clea/CLEAhome.html
- Proof of dark matter, with measuring the rotation of a spiral galaxy
- "Remote observing" **Badlands Observatory**

http://www.badlandsobservatory.my-sky.com:8012/index.asp South Dakota - USA

Badlands Observatory

South Dakota - USA



66cm (26inch) Newtonian telescope

Thank YOU !