

LSO summer internship program: Lomnický Štít Observatory (LSO)

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Content:

- The LSO itself
- Two main topics:
 - history
 - building inside + outside and infrastructure

LSO: history

- The cable car story: 1936-1938: TL-SP + 1938-1941: SP-LS
- Cable car + a “pub” (mountain hut) + a meteorological station at the LS
- Climatologist A. Bečvář at the Štrbské Pleso spa using a private observatory equipped with the home-made instruments
- ZEISS 60cm Cassegrain reflector in boxes at Prešov
- A plan to install it to the LS building → construction of the Skalnaté Pleso Observatory (1941-1943)
- One generation satisfied... Atlases, new comets + showers

LSO: history

- The next generation in 50-ties?
- A plan to exploit the quite unique high altitude of the LS for observations and measurements which can not be performed at lower altitudes: 1/ coronagraphic observations of the Sun, 2/ cosmic rays measurements
- A little of “astro-politics”:
 - hot war → cold war, peaceful competition of E~W in sport, science
 - International Geophysics Year (IGY) 1957-1963: satellites, antarctic research stations, ...
 - My surmise: Moscow → Prague: joint this effort! Party → Academy: search in requests of directors for money → selection of the joint proposal of astronomers (Skalnate Pleso, Dr. Guth) + physicists (Prague, Košice)
 - Building of the Lomnický štít Observatory...

LSO: history

- Lomnicky Stit Observatory building:
 - All transportation: cable cars
 - breaking and blasting stone between the cable car building and the geographical summit of the LS: to make free space and to get material
 - 3 floors: $\sim 17 \times \sim 7$ m
 - Double walls, triple windows
 - Separate pillar for the mount+coronagraphs
 - ZEISS high-altitude dome, tower + room: coelostat + vertical reflector + diffraction grating spectrograph
 - Originally: batteries + diesel-generator only, no WC or heating in the building (used that in the cable car building), photolab, water from roof or transported by the cable car, cosmic rays monitors inside/outside, several persons on duty (6-8)

LSO: history

- Lomnický štít Observatory building:

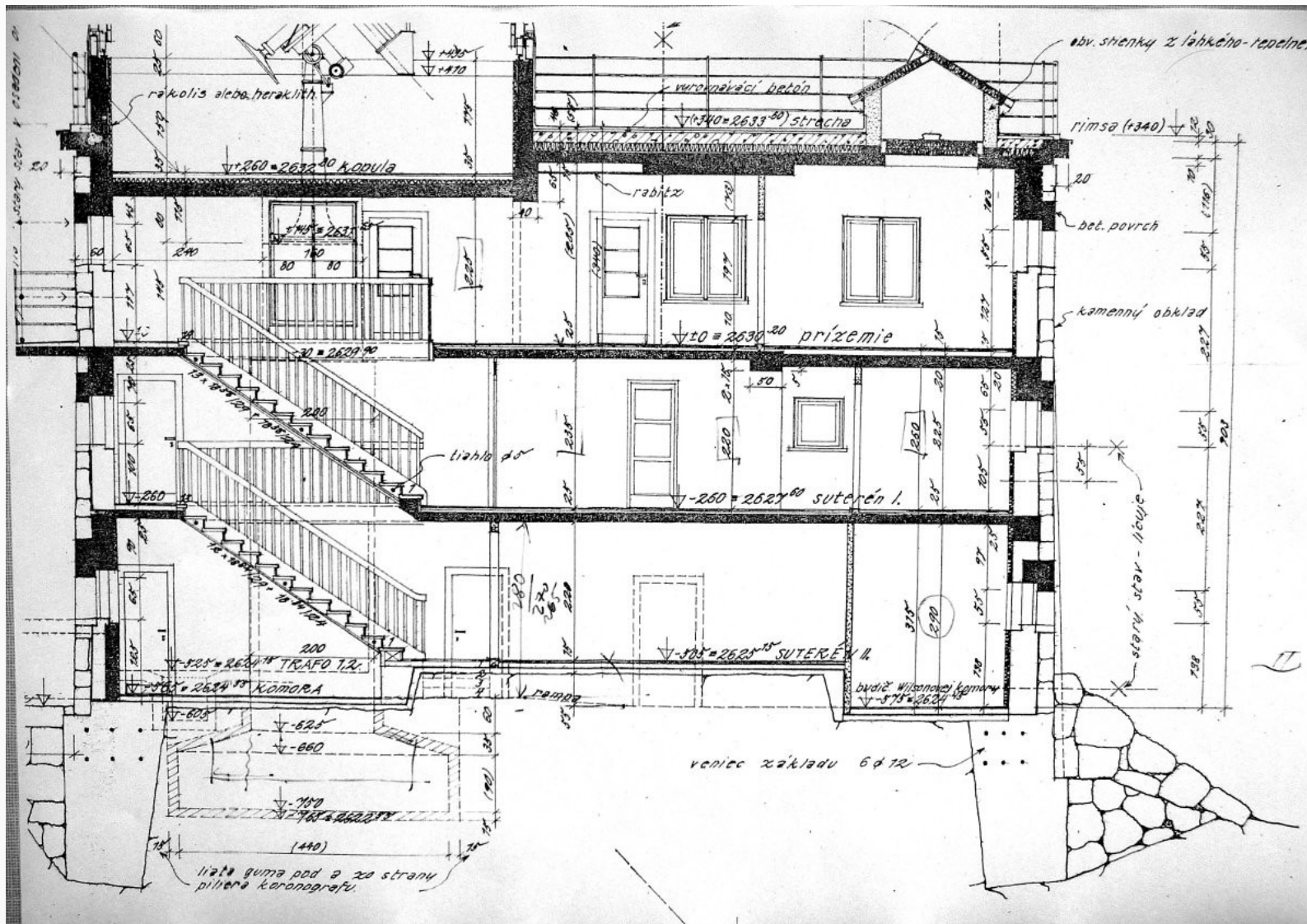


LSO: history

- Lomnicky Stit Observatory building:



- Lomnický štít Observatory building:



LSO: history

- Lomnický štít Observatory:
 - Slovak Academy of Sciences
 - 2 institutes: Astronomical Institute + Institute of Experimental physics → dome + container

LSO: history

- Lomnický Štít Observatory building - changes in time:
 - Own electric power lines from SP
 - Polyurethane plastic glue insulation of cracks between stones
 - Own heating (twice)
 - Rooms: offices + single sleeping rooms (if possible)
 - 2 bathrooms with WC
 - 4 types of water
 - New windows (twice)
 - Computer network + connection to the rest of world
 - Backup diesel generator (~50 hours)
 - Workshop: miller + lathe + ...

LSO: history

- Lomnický Štít Observatory instrumentation - start:
 - ZEISS high-latitude dome
 - ZEISS equatorial mount VII
 - ZEISS 200/3000/4000 coronagraph (1st: 1962, 2nd: 1970)
 - Home-made diffraction grating spectrograph: coronal emission spectral lines (green, red, yellow)
 - Šolc narrow-band filter (656 nm, fwhm 0.6 nm): H alpha prominence imaging
 - Mostly patrol measurements

LSO: history

- Lomnický Štít Observatory instrumentation - changes in time:
 - Photographic film → 2D photomultiplier/photodiode/CCD detectors → 2D CMOS detectors nowadays
 - Simple “uhrgang” hour drive → photoelectric pointing systems: analog → photoelectric digital system
 - Mutual co-alignment of both coronagraphs during observations
 - diffraction grating spectrograph + narrow-band filter → tunable Lyot-Ohman filters (530-1100 nm, fwhm 0.03-0.13 nm) with polarimeter
 - Mostly patrol measurements → dedicated observing programs
 - Photolab → server room
 - Microphotometer for films → computer data handling

LSO: building inside

- Heating: electric, central, backed up
- Water: 4 types – utility water (roof+cable car), potable water after boiling (cable car), potable water (shop), mineral water (shop)
- Garbage: separation, delivery down (you or workshop man)
- Server room: double floor, air conditioning, external unit inside!, servers + network switches + UPSs, el. cables and fiber optics to instruments in dome
- Workshop: lathe, miller, stand drill, tools, scaffold, el. board
- diesel-generator: automatic start/stop, ~50 hours
- Storage places

LSO: building inside

- Kitchen
- Sleeping rooms: 5
- Bottom bathroom with WC
- Backups: petrol, gas, ...
- Offices: AI SAS – electro-office, astro-office + IEP offices
- Separate electrical net: 1:1 transformer
- Wireless internet inside + internet radio connections to world

LSO: building outside

- Walls
- Windows
- Dome + roof
- IEP container for instrumentation
- Tower
- Ladder + snow tool
- Own electric power lines to SP

LSO: walk

- Let's walk through the building!