

New astronomical instrumentation of Faculty of Science, University of P.J. Šafárik in Košice

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Abstract. In this contribution we briefly present new telescopes and detectors used at the Faculty of Science, University of P. J. Šafárik in Košice.

Key words: telescope – CCD cameras – spectrograph

1. Location of observatory

Our new observational facility is located at the Astronomical Observatory Kolonica Saddle (48°57'N, 22°16'E, altitude 460m). It is situated in north-east part of Slovakia, about 120km from Košice. The observatory lies in the Dark-Sky Park Poloniny, a place with the best conditions for astronomical observations in Slovakia.

2. Telescopes and detectors

Our main telescope is the PlaneWave¹ **CDK20** telescope mounted on the **Paramount ME** mount² (see Fig. 1). It is situated in an enclosure with a moving roof. The primary mirror diameter is 508mm with a focal ratio in the Cassegrain focus f/6.8. The corrected Dall-Kirkham optical design is optimized to provide a high quality image also for large format CCD cameras. A carbon-fibre truss construction with minimal thermal expansion together with a relatively fast focal ratio make the telescope solid and compact and suitable for a small university observatory. The telescope is equipped with an automatic focuser and thermal stabilization of the primary mirror. Paramount ME is a research-grade German equatorial mount designed for uninterrupted, carefree, local or remote operation. It can shoulder up to 68 kg of instrumental payload and provide high tracking performance.

The main instrument used with CDK20 is the commercial **eShel** spectrograph from Shelyak Instruments³. It is a fiber-fed echelle spectrograph with

¹<http://planewave.com/products-page/telescopes/20-inch-cdk-optical-tube-assembly/>

²<http://www.bisque.com/sc/pages/Paramount-ME.aspx>

³<http://www.shelyak.com/rubrique.php>



Figure 1. CDK20 main telescope on Paramout ME mount.

the resolution power $R=12000$. The spectrograph is used with Moravian Instruments⁴ CCD camera **G2-8300**.

The telescope can be also used with the large format (4096 x 4096 pixels) **G4-16000** CCD camera from the same producer, with standard *UBVRI* Bessel filters. In this configuration, the FoV reached $36' \times 36'$ and a resolution of $0.54''/\text{pixel}$ with no binning.

Our next instrument is a telephoto lens **Sigma 2.8/300** placed on the Celestron-CGEM portable mount. It is commercially available glass with a corrected high-quality image, which is very useful for astronomical purposes. This instrument is used with an **Atik 383L**+⁵ CCD camera with Sloan filters of the second generation $u'g'r'i'z'$, which give us the $\text{FoV} = 3.5^\circ \times 2.6^\circ$ and resolution $3.7''/\text{pixel}$ with no binning.

3. Observational focus

Our instruments are mainly intended for education purposes of university students, but they can be used also for gathering useful observations of a wide range of objects. The possibility to combine telescopes with different detectors

⁴<http://www.gxccd.com/cat?id=2>

⁵<http://www.atik-cameras.com/products/info/atik-383l-plus>

give us a large range of opportunities for research. More detailed information about our telescopes, detectors and observing programs can be found at our web page <http://astronomy.science.upjs.sk/kolonica/>

- **CDK20 + eShel** – spectroscopy of Be stars, symbiotic stars, novae and supernovae, spectral classification of bright stars, radial velocities measurements of bright binary stars with long periods.
- **CDK20 + G4-16000** – high-precision (milli-magnitudes) photometry of eclipsing binaries, extrasolar planets transits, asteroids and pulsating stars.
- **Sigma + Atik383L+** – wide-field photometric monitoring and/or searching of new variable stars, extrasolar planets, asteroids and comets.

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