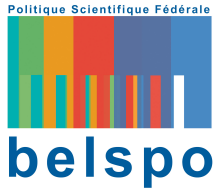
Division A Working Group on Astrometry by Small Ground-Based Telescopes

Anatoliy Ivantsov[1,2], Marcelo Assafin[3], William Thuillot[2], and WG Members

[1]Royal Observatory of Belgium, Ringlaan / av. Circulaire 3, Ukkel / Uccle, BE-1180, Belgium
[2]Paris Observatory – IMCCE, PSL University, Sorbonne Université, Lille University, CNRS, av. Denfert-Rochereau 77, Paris, F-75014, France
[3]Federal University of Rio de Janeiro, Valongo Observatory, Ladeira do Pedro Antonio 43 - Saude, 20080-090 Rio de Janeiro, Brazil

anatoliy.ivantsov@oma.be

Universidade Federal do Rio de Janeiro



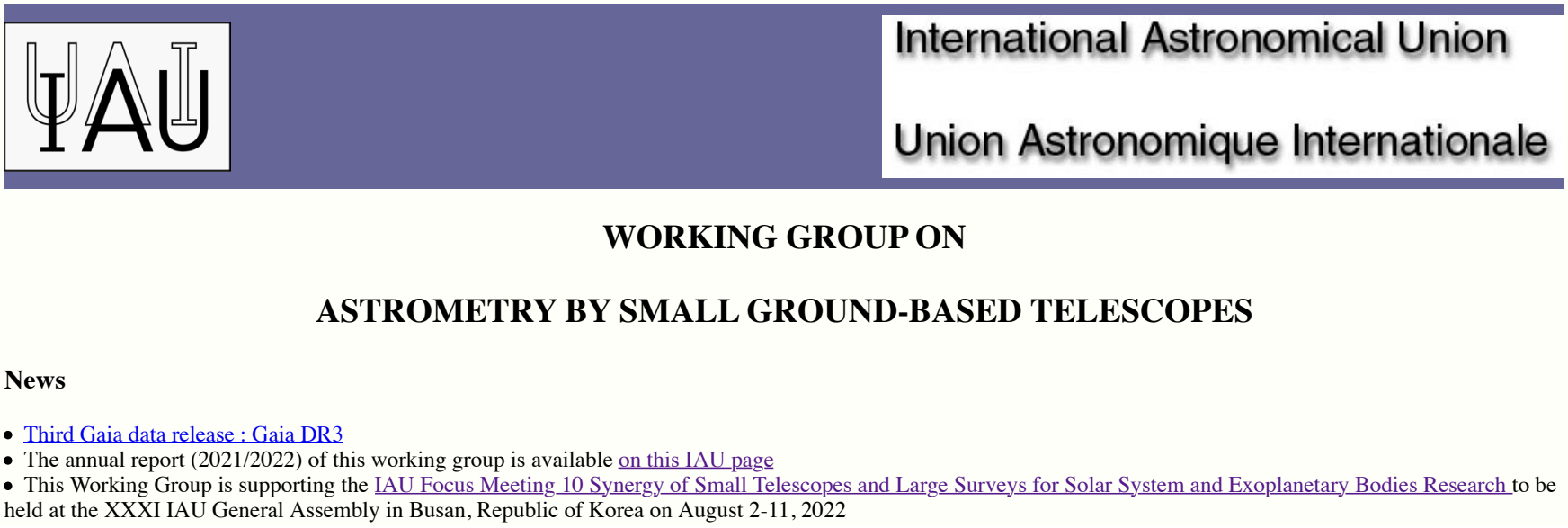
Overview

Preambule

- The WG was initiated by Division 1 (Fundamental Astronomy) at the XXVI IAU General Assembly in Prague in August 2006.
- The WG goal is to
  1. to update and maintain information on astrometric programmes and activities carried out by small telescopes (up to 2m diameter);
  2. to diffuse news through the webpages and by e-mails;
  3. to facilitate the collaborations and to help for the coordination of the activities in astrometry from ground-based telescopes;
  4. to encourage teaching astrometry for the next generations.

2021-2022 period

- Chair: Anatoliy Ivantsov (Royal Observatory of Belgium)
- Co-Chair: Marcelo Assafin (Federal University of Rio de Janeiro, Valongo Observatory)
- The WG comprises 24 members from 10 countries.
- The WG web-page is hosted at https://iau_wgnps.imcce.fr.
- Webmaster: William Thuillot (Paris Observatory)



2021-2022 period

- Jean-Eudes Arlot (Paris Observatory, France) reported on
  1. the observation of mutual events of the Galilean satellites which provide high-quality data allowing to reach an unprecedented resolution in the satellites' dynamical models. A worldwide campaign of observations of the mutual events of the Galilean satellites was conducted in 2021: 37 observers from 18 different sites of observation observed 85 phenomena;
  2. the ongoing digitizing project of photographic plates.
- Marcelo Assafin and Roberto Vieira-Martins (Federal University of Rio de Janeiro, Valongo Observatory) reported on observations of small bodies, mostly TNOs, dwarf planets and natural satellites of Jupiter and Uranus, and also Jupiter Trojan asteroids (Santos-Filho et al., 2019), astrometric observations of Jupiter irregular satellites, observations of 15 mutual events of the Galilean satellites, Amalthea and Thebe.

2021-2022 period

- Charlie Thomas Finch (U.S. Naval Observatory, USA) reported that
  1. astrometric and photometric observations continue with the Deep South Telescope (DST) after a long pause in 2020 due to the COVID-19 pandemic with 10,298 exposures taken in 2021. The main goal is to monitor a select list of extragalactic celestial reference frame sources (AGN, QSOs) in hopes of better understanding the radio-optical position offsets;
  2. the principal instrument (Sophia 4K CCD) has been down for repairs and a stop gap CCD camera (Marana) has been installed. An IR camera is planned for the optical IR port on DST supporting an ICRF photometric characterization and monitoring effort, as well as southern-sky priorities for infrared-bright objects;
  3. a USNO Bright Star Catalog paper has been submitted to AJ using data obtained from both the USNO Robotic Astrometric Telescope (URAT) and UBAD project using the 1.55-meter telescope at the Naval Observatory Flagstaff Station.

2021-2022 period

- William Thuillot (IMCCE, Paris Observatory, France) reported on monitoring Gaia alerts for Solar System Objects (SSOs). As soon as Gaia detects an uncatalogued mobile source, an alert is triggered via a public website to the Gaia-FUN-SSO network. More than 300 uncatalogued SSOs, either newly detected or with imprecise orbits, have been observed and their astrometry submitted to the IAU Minor Planet Center. These observations were made by telescopes of 1m diameter or less at the Las Cumbres Global Telescope, Observatoire de Haute-Provence, C2PU at Calern-OCA, Terskol, Kyiv Comet Station, Odessa-Mayaki, Abastumani (Carry et al., 2021).

2021-2022 period

- Anatoliy Ivantsov (Royal Observatory of Belgium) reports on the **IAU Focus Meeting 10: Synergy of Small Telescopes and Large Surveys for Solar System and Exoplanetary Bodies Research**, https://iaufm10.org hold at the XXXI IAU General Assembly in Busan, Republic of Korea. The SOC comprises of 3 WG members.

Conclusions

- Small telescopes with apertures less than 2 m are still useful for getting accurate astrometric measurements of **Small Solar System Bodies**, **natural satellites** and **extragalactic sources** either through direct imaging or using photometric measurements of mutual events.
- The WG is actively facilitating the **exchange of information, coordination of campaigns and setup of telescope networks**.
- The WG is promoting **complementarity of large astronomical surveys and astronomy done with small telescopes**, **sharing astrometric ideas and achievements** through supporting the IAU Focus Meeting 10.