

Dear A1 commission member,

Dec. 16th., 2019

Following are three announcements concerning our commission

1. Colloquium “Active Galaxies and Quasar Reference Systems in the Gaia era”, Paris, June 15-19, 2020
2. Double star Catalog access and changes at USNO Catalog Access
3. Focus Meeting and Symposium proposals for the IAU General Assembly at Busan in 2021

Best Regards,

Jean Souchay

1. Colloquium “Active Galaxies and Quasar Reference Systems in the Gaia era”, Paris, June 15-19, 2020

Summary

Quasars and AGNs, which play a fundamental role in the evolution of their host galaxies, are also used to build fundamental celestial reference systems (i.e., the ICRF) because of their extreme distances and therefore negligible proper motions. With the advent of the Gaia astrometric mission, visual-wavelength astrometry has entered the micro-arcsecond domain, where significant positional offsets have been found with the radio positions of quasars. These offsets are likely physical in nature, owing to processes of direct interest to the AGN community more broadly, such as radio jet production, outflows, dual/binary AGNs, lensing, circumnuclear star formation, etc.

This conference will bring together AGN and CRF researchers to discuss these issues. The chosen venue is the Institut d’astrophysique de Paris (IAP), next to Observatoire de Paris, both institutions with a long and rich history of astrophysical research across a broad range of fields, including those pertaining to navigation, the celestial reference frame (CRF), quasar research and galaxy evolution. The date of this conference, 15-19 June 2020, is optimal as it lies between Gaia DR2, the 3rd realization of the ICRF, and Gaia DR3. During this period, the international reference frame community will be developing a road map for the next realization of the ICRF, including integration of high accuracy, visible AGN data from Gaia with the radio VLBI data that currently composes the ICRF3.

Rationale

With the dawn of micro-arcsecond optical astrometry thanks to Gaia, a subject of increasing astrophysical interest is the appearance of positional offsets between the radio and optical positions of quasars that define the ICRF. These offsets are of profound importance to astrometry and reference frame work, as their existence currently sets a limit for the accuracy and definition of the CRF at non-radio wavelengths, limiting research in topics such as geodesy, the secular aberration, Earth orientation and ephemerides, proper motions and trajectories of stars in our galaxy and its satellites, local measurements of the Hubble constant, the stochastic gravitational wave background, and in general any field that benefits from optimal absolute astrometry. A developing body of research has shown that these optical/radio offsets may be due to real astrophysical processes associated with the active galactic nuclei (AGN) that power quasars, such as jet launching/orientation, or real physical offsets between the AGN and its host galaxy. The time is ripe for a dedicated meeting to bring together AGN and CRF researchers to discuss outstanding questions in AGN research that may affect apparent positions. These questions include, but are not limited to:

- Our current understanding of quasar optical/radio offsets (i.e., their physical nature) and mitigation strategies.
- Relevant AGN/source galaxy physics: jet launching, obscuration, luminosity/obscuration variability, binarity, AGN-source galaxy effects and interactions, such as mergers and AGN feedback
- New frontiers in AGN research with current and upcoming facilities, such as Gaia/GaiaNIR, Pan-STARRS, LSST, and the ngVLA.
- Limitations of current instrumentation and/or new methodologies with current resources.
- Strategies for maximizing all-sky samples of AGN/QSOs (e.g., multi-wavelength, time-domain techniques, upcoming surveys).
- AGN problematic for astrometry (e.g., lensed QSOs, dual/binary AGN, dislodged AGN): how to find and characterize them.
- Astrometry in practice: position measurement techniques, catalog cross-matching strategies (e.g., photometric priors, Bayesian considerations); quantifying and optimizing reliability/completeness.

This meeting will serve as a venue to discuss the status and the direction of the ICRF, as well as additional issues that affect the ICRF, such as the need to maximize highly reliable all-sky samples of quasars and AGN, and the need for more southern sky sources. Finally, with extremely large photometric and astrometric catalogs making up much of modern astronomical research, discussion of astrometry in practice is warranted, such as developing sophisticated techniques for maximizing the reliability and completeness of catalog cross-matches. This will be of utmost value to the AGN community, which relies intimately on the

ability to produce highly reliable and statistically complete multi-wavelength samples of AGN and their host galaxies.

Probable invited talks :

Roberto Assef : AGN selection techniques

Laura Blecha : Dual/binary AGN

Jeremy Darling: New frontiers in AGN/CRF research with current and upcoming facilities

Valeri Makarov: Known optical/radio offsets of AGN

Eric Perlman: Multi-wavelength studies of AGN jets, including with VLBI

Francois-Xavier Pineau: Astrometry in practice

Alexander Plavin: AGN physics: jet launching

Yue Shen: Varstrometry

Phil Uttley: AGN intrinsic variability across multiple wavelengths

Alet de Witt: Status and direction of the ICRF

Chairs & contacts :

B. Rocca-Volmerange, IAP Paris, France

rocca@iap.fr

N. Secrest, USNO, USA

nathansecrest@msn.com

J. Souchay, SYRTE Observatoire de Paris

Jean.Souchay@obspm.fr

SOC: B. Dorland, P. Charlot, E. Glikman, L. Ho, M. Johnson, C. Ricci, B. Rocca, D. Rosario, H.Schmitt, N. Secrest, J. Souchay, D. Wang

[*Transmitted by Nathan Secrest*]

2. Double Star Catalog Access and changes at USNO Catalog Access

The US Naval Observatory Websites are undergoing modernization and will be offline starting Thursday, 24 October 2019. The expected completion of work and return of service is estimated as 30 April 2020. Until that time, the only access to doublestar catalogs will be via our website mirrors:

- The Washington Double Star Catalog : <http://www.astro.gsu.edu/wds/>
- Sixth Catalog of Orbits of Visual Binary Stars:
<http://www.astro.gsu.edu/wds/orb6.html>
- Second Catalog of Rectilinear Elements : <http://www.astro.gsu.edu/wds/lin2.html>
- Fourth Catalog of Interferometric Measurements of Binary Stars :
<http://www.astro.gsu.edu/wds/int4.html>
- The Third Photometric Magnitude Difference Catalog :
<http://www.astro.gsu.edu/wds/dm3.html>
- IAU Commission G1 (Binary and Multiple Stars) webpage :

<http://www.astro.gsu.edu/wds/bsl/>

- Double Star Astronomy at the U.S. Naval Observatory :

http://www.astro.gsu.edu/wds/ds_history.html

Changes in the Visual Orbit Catalog

After maintaining the Visual Orbit Catalog for nearly two decades, long-time IAU Member William Hartkopf has retired. We welcome Dr. Rachel Matson (GSU, 2016) who will henceforward lead maintenance efforts of the Visual Orbit Catalog and will also lead the transition of our speckle interferometry from ICCDs (which have been in use since its inception in 1990) to EMCCDs sometime in 2020.

[Transmitted by N. Zacharias]

3. Focus Meeting and Symposium proposals for the IAU General Assembly at Busan in 2021

In the frame of the IAU General Assembly, two proposals involving the A1 commission have been sent to the selecting committee.

- A focus meeting entitled “Astrometry for the 21st Century Astronomy”
- A symposium entitled “Reference systems and their ties with the rotation of the Earth and other Solar System bodies”

The two proposals will be installed in the A1 commission web-site

[Transmitted by A. Brown & J. Souchay]