ἀγεωμέτρητος μηδείς εἰσίτω

# VIII Workshop de Epistemología e Historia de la Astronomía

2 y 3 de noviembre, 2023

Universidad Pedagógica Nacional

Piedras 1080, CABA

Las reuniones se llevarán a cabo en el auditorio, en la planta baja de UNIPE

Organizado por la Universidad Pedagógica Nacional, en conjunto con el Proyecto de Investigación "Astronomía pre-Newtoniana: aspectos históricos epistemológicamente orientados (segunda etapa)" (PICT 2019-01532), radicado en la Universidad Nacional de Quilmes.

# PROGRAMA

## 2 de noviembre

**MAÑANA.**

**9 hs.**

Presentación. Dr. Gonzalo Recio

**9.15 a 10.15 hs.**

Gonzalo Recio (Universidad Pedagógica Nacional, Universidad Nacional de Quilmes/CONICET).

*La Vía Láctea en el Almagesto*

El segundo capítulo del libro VIII del Almagesto está dedicado a una descripción relativamente detallada de la Vía Láctea. La exposición se focaliza en explicar la estructura y algunos detalles de tal descripción, y analiza los aciertos ptolemaicos, al mismo tiempo que explora las posibles causas de sus errores.

**10.30 a 11.30 hs.**

Christián Carman (Universidad Nacional de Quilmes/CONICET) y Hernán Grecco (Universidad de Buenos Aires/CONICET)

*La precisión en las observaciones de David Fabricius: un enfoque estadístico*

Johannes Kepler escribió que, luego de la muerte de Tycho Brahe, el mejor observador del momento era David Fabricius. Hemos analizado más de 500 observaciones que Fabricius envió a Tycho y a Kepler. En esta ponencia nos proponemos mostrar la metodología, los problemas con los que nos enfrentamos y

las soluciones que encontramos para poder hacer un análisis robusto de los datos. Creemos que el camino que recorrimos puede servir de insumo para otros estudios similares. Y contarles, por supuesto, qué tan bueno era Fabricius como observador.

**11.45 a 12.45 hs.**

Stefan Zieme (Humboldt-Universität zu Berlin)

*On the Translations and Transmission of the Almagest*

As one of the most important sources of mathematical astronomy Ptolemy's Almagest was copied and translated for more than one and a half millennia. Today, there about 150 manuscript witnesses still extant through which knowledge about the Almagest has been transmitted in different cultures, languages, and times. These include, beyond Greek and Byzantine sources, translations from Greek into Arabic, Arabic into Latin, Greek into Latin, and Arabic into Hebrew. Over centuries, translators, scribes, or owners of these manuscripts compared, annotated, or corrected their manuscript sources. Especially mathematical tables and geometrical diagrams, numerous within the Almagest, feature manifold variations among different manuscript traditions. I will use tabular and diagrammatic variations from the entire corpus of manuscript witnesses for a network analysis that aims to analyze and visualize the transmission of the Almagest across space, time, and culture. My main idea is to analyze cross-cultural exchange of knowledge based on mathematical and geometrical structures and, thus, independent of language specific frameworks.

**TARDE.**

**14.30 a 15.30 hs.**

Christián Carman (Universidad Nacional de Quilmes/CONICET) y Diego Pelegrin (Universidad de Buenos Aires)

*Diagramando la revolución Copernicana*

Hacia el final de su vida, Nicolás Copérnico delegó en su único discípulo, el jóven y entusiasta Joaquín Rheticus, la edición de su obra magna: el De Revolutionibus Orbium Coelestium. Sabemos que Rheticus se llevó una copia del manuscrito de Copérnico para preparar la edición en Nuremberg. Sabemos, también, que Rheticus tuvo que abandonar la supervisión de la edición antes de que se concluyera, quedando ésta a cargo de Andreas Osiander. Lamentablemente, la copia de Rheticus está perdida, pero el manuscrito autógrafo de Copérnico ha sido conservado. Distintos trabajos han mostrado las diferencias en el texto entre el manuscrito de Copérnico y la edición de Rheticus. Pero no existe ningún estudio comparativo entre los diagramas de una y otra versión del De Revolutionibus. En esta ponencia, mostraremos a partir de varios casos las notables e interesantísimas diferencias entre los diagramas del manuscrito original de Copérnico y los de la edición de Rheticus y Osiander.

**15.45 a 16.45 hs.**

James Evans (University of Pudget Sound)

*The Gravitation Theory of Georges-Louis Le Sage (1724-1803) and its Reception: Debates over Method and Evidence in Science*

Georges-Louis Le Sage (1724-1803) of Geneva was the inventor of a mechanical explanation of gravity. Le Sage was a good Newtonian who accepted the validity of the inverse-square law, but belonged to a generation who still believed in the possibility of a mechanical explanation. The idea is that the universe is bathed in a sea of ultramundane corpuscles of minute mass and enormous speed. Objects of ordinary size, such as apples or planets, are nearly transparent to these corpuscles.

But once in a while a corpuscle will be stopped. Thus the apple and the planet partially screen one another from the rain of corpuscles. The two objects, which appear to attract one another, are actually pushed together. With the right auxiliary hypotheses, this picture does result in an effective attractive force that falls off as the inverse square of the distance. In 1758 Le Sage's submission to the Academy of Rouen was crowned for its explanation of chemical affinity—for Le Sage believed that chemical affinity and gravitational attraction could be explained by the same mechanism. Le Sage had his prize-winning *Essai de chymie méchanique* privately printed and distributed at least 180 copies to his friends, correspondents, and students. And in 1784 his "Newtonian Lucretius" was published in the French-language Mémoires of the Berlin Academy. But Le Sage's most important means of promoting the theory was his vast correspondence. Le Sage's correspondents included Jean Le Rond d'Alembert, Jean-Sylvain Bailly, Daniel Bernoulli, Charles Bonnet, Roger Boscovich, Alexis-Claude Clairaut, Leonhard Euler, Joseph-Louis Lagrange, Jean-André De Luc, and Pierre-Simon Laplace (who calculated some consequences of Le Sage's theory in his *Mécanique céleste*). In many cases, Le Sage engaged his correspondents in a discussion of gravity theories, as well as broader questions of the role of hypotheses, and the validity of different methods of demonstration. Thus the Le Sage correspondence is an excellent resource for a study of scientific attitudes and postures.

## 3 de noviembre

**MAÑANA.**

**9 a 10 hs.**

Nathan Sidoli (Waseda University)

*Hipparchos and the Ancient Analemma*

In a well-known passage in his *Commentary on the Phenomena of Aratos and Eudoxos*, In Arat. II.2.25-28, Hipparchos states three numerical values related to the rising phenomena of the star Upsilon Boötis and claims that he showed how to

produce these numbers *dia tōn grammōn* in his systematic treatises. In this talk, I will show that these values can all be computed using plane chord-table trigonometry on the geometrical model known as the analemma.

**10.15 a 11.15 hs.**

Francesca Schironi y Enrico Landi (University of Michigan)

*Dia tōn grammōn: Hipparchus on Simultaneous Risings and Settings*

**11.30 a 12.30 hs.**

Alexander Jones (New York University)

*Playing around with a reconstructed instrument of Ptolemy's*

In a contribution to the 2021 *International Congress of History of Science and Technology*, Victor Gysembergh, Emanuel Zingg, and I announced that twelve palimpsest pages of an unidentified and hitherto mostly illegible Greek astronomical text whose presence in the manuscript *Ambrosiana L99* sup was reported by Heiberg in the late 19th century in fact belong to an otherwise lost treatise by Ptolemy on an instrument of his own devising that he named Meteoroscope; we gave a fuller presentation of this discovery in an article in the *Archive for History of Exact Sciences* published early this year. Relying on multispectral and ultraviolet imaging, we have made substantial progress in reading the pages towards an eventual edition, though some passages and even entire pages continue to be resistant to our best efforts. In any event the recovered text will only represent discontinuous excerpts from the original treatise, so there will be many questions about Ptolemy's instrument and the treatise that can only be addressed by extrapolating from the extant passages.

While this paleographical and philological work advances, I have been collaborating with New York University's LaGuardia Studio, a facility devoted to advanced 3D printing, to make a working reconstruction of the Meteoroscope. My immediate aims for this project are, first, to test and refine our understanding of the instrument's

structure, and, second, to learn about how it was or might have been used beyond what the preserved text can tell us directly. My presentation will report some outcomes of my initial experimenting with the model.

**12.30 hs.**

Palabras de cierre. Dr. Christián C. Carman