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***Investigating Art, History and Literature with Astronomy: Determining Time, Place, and Other Hidden Details Linked to the Stars*, by Donald W. Olsen. (Chichester, Springer, Praxis Publishing, 2022) Pp. 354. ISBN 978-3-030-95553-3 (paperback), 165 × 245 mm. US\$39:99.**

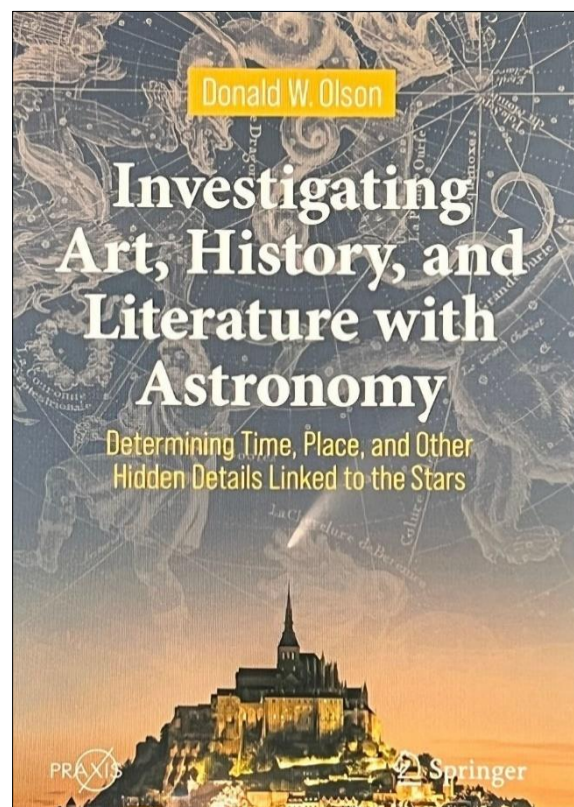
As a follow up of his two previous books, *Celestial Sleuth*, 2014, and *Further Adventures of a Celestial Sleuth*, Donald W. Olsen, Professor of Astronomy at Texas State University in San Marcos, Texas, expands upon his previous studies in collaboration with the college Honors Class that he created and teaches. By instructing students in the basics of astronomy along with investigative techniques, such as determining tides, solar shadows, and motions of the heavenly bodies, the in-depth class on astronomy approaches the science in unusual ways. After students learn the fundamentals of astronomy, they investigate instances of astronomical references within historical events, in the creation of art and literature, and in daily life. As part of the course work, he often leaves the formality of the classroom and escorts students to cities near and far: the western United States, England, France, Greece, Switzerland, Germany and Norway, to solve the proffered mysteries concerning astronomy.

The book is divided into five parts; the initial section explains the various tools, both scientific and historical, available for providing the pertinent information for each of the twenty subjects that were selected for deeper research. The students learned how to dig into archival material, vintage maps, personal diaries, military records, old postcards, and especially how to find accurate positions of the Sun, Moon, planets and stars in the distant past, easily obtained through current astronomical software.

The second section focuses on well-known artworks by examining the paintings of renowned artists: Vermeer, Monet, Munch, Turner and O'Keefe. The students' background searches pulled together all of these techniques and were able to determine precise locations and exact time periods for the artist's famous creations. The celebrated artworks are compared with photographs and vintage postcards to establish the exact viewpoint of the artist. For instance, Monet created two paintings on the island of Belle Île; the team of sleuths were able to determine the time of day depicted by studying the angle of the shadows painted by the artist, even determining which overlooking window he used. By reading

published letters of the artists, the students gathered more specific information to establish astronomical details helpful for art historians.

The third part of the book turns to historical events from widely different time periods that concern influential characters such as: Alexander the Great, King John Lackland, Roosevelt and Churchill. They also examined warfare at the medieval island community of Mont Saint-Michel and events of World War II. By applying the tools and knowledge of astronomical cycles, new information was gained to solve unanswered questions and correct misunderstandings. The classmates investigated the circumstances surrounding the tragic loss of King John's wagons loaded with exquisite Royal treasures including the crown



jewels. The irreplaceable British riches were buried when engulfed in tidal quicksand near the English coast. Students studied the phases of the Moon at the time and the unusual phenomenon known as perigean spring tides.

Section four directs the class's systematic investigations into the prominent literature of Chaucer, Shakespeare and Longfellow where they looked for astronomical clues in order to gain a clearer picture of the author's intentions. They reproduced the night skies at the time of their writings and acquired knowledge of eclipse patterns. After considering history's complicated calendar revisions and reviewing contemporary writings and almanacs, the students established the exact times of the two eclipses mentioned by Shakespeare in *King Lear*.

The final chapter searched out exact positions of various geographical locations such as, Death Valley and Mount Whitney. The book then ends rather abruptly with no summary or overall conclusions. The course study shows how the students learned critical thinking and investigative techniques but adds more to social history than to astronomical science.

The book covers a wide range of topics and is well referenced with an extended bibliography at the end of each section for further studies. The author avoids technical terminology and is well illustrated so that it may be enjoyed by a wider audience. The text provides contemporary readers with a broad variety of examples of how astronomical events were intimately intertwined in the lives of the people in earlier cultures.

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Gaṇitagannaḍi: Mirror of Mathematics, An Astronomy Text of 1604 CE in Kannada by Śaṅkaranārāyaṇa Joisaru of Śṛṅgeri, translated and with a mathematical analysis by B.S. Shylaja and Seetharama Javagal. (Bengaluru, Navakarnataka Publications, 2021). Pp. iv + 220. ISBN: 978-81-953177-2-1 (paperback), 140 × 210 mm, Rs 315 (India), US\$29 (for overseas).

From the fifteenth century onwards there was a great spurt in the preparation of original handbooks (*karanas*) and commentaries on the original *siddhanthas* (canonical works) and even on the handbooks. While the Kerala works on mathematical astronomy from the fourteenth century onwards are now well known, thanks to the dedicated efforts of scholars like the late Professor K.V. Sarma, the contemporary similar output in other languages, such as Telugu and Kannada, is comparatively less known.

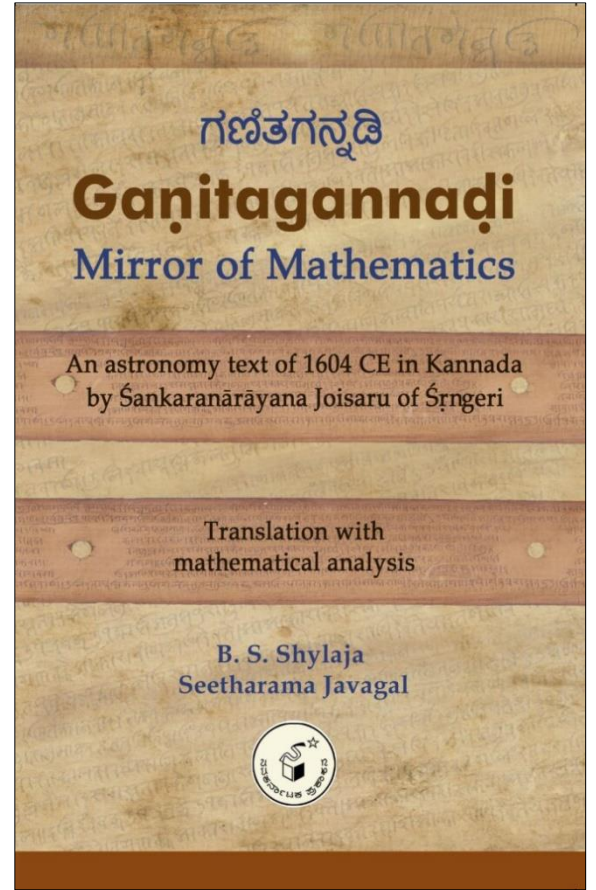
The present work under review is a very competent English translation of the learned Kannada commentary (CE 1604) of the original Sanskrit work *Varsikatantra* by Viddanacarya. In the present book, Dr B.S. Shylaja has provided the original *slokas* in Sanskrit along with Śaṅkaranārāyaṇa Joisaru's Kannada commentary. She has done a great service to modern science community by providing an explanatory mathematical analysis of the astronomical procedures.

The printed text consists of eight chapters in 220 pages. The English translator has, in appropriate places compared this text with another text *tantra darpana* in Sanskrit. The very first chapter, *dhruvadhikara*, includes the planetary constant parameters and also the computing of the elapsed days since the epoch began (*ahargana*). Furthermore, this chapter elaborates on

determining the mean positions of the heavenly bodies.

The *Grahasphutadhikara* provides the detailed procedure for determining the *true* positions of the heavenly bodies. In the case of heavenly bodies (except *Rahu* and *Ketu*), the two major equations applied to their mean positions are (i) *mandaphala* and (ii) *sighraphala*. These two correspond to the equation of the centre and transformation from heliocentric position to geocentric position.

The *Grahanadhikara* discusses the computation of lunar and solar eclipses, and the general procedure of the calculations is explained in detail. One of the key contributions of this text is the chapter on *Parilekha*, the geometrical represent-



ation of eclipses. Dr Shylaja has dwelt on this topic at length by explaining the intricacies of the eclipse diagrams. In fact, the presentation of this topic by the original author shows the importance given to the actual observation of eclipses.

The phenomena of 'Parallel Aspects' called *Vaidhriti* and *Vyatipata* correspond to the equality of the declinations (*Kraanti saamyā*). This topic is also explained in detail by Dr Shylaja. The chapter *Yuddha – Samagama* discusses two special phenomena viz., (1) the rising and setting of stars and planets both heliacally and daily, and (2) conjunctions of any two planets with them-