



## Planets, comets and small bodies in Jules Verne's novels

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### Abstract

Almost all the *Voyages Extraordinaires* written by Jules Verne refer to astronomy. In some of them, astronomy is even the leading theme. However, Jules Verne was basically not learned in science. His knowledge of astronomy came from contemporaneous popular publications and discussions with specialists among his friends or his family. In this contribution, I examine, from selected texts and illustrations of his novels, how astronomy — and especially planetary science — was perceived and conveyed by Jules Verne, with errors and limitations on the one hand, with great respect and enthusiasm on the other hand.

### 1. Introduction

Jules Verne (1828–1905) wrote more than 60 novels which constitute the *Voyages Extraordinaires* series (an authoritative biography of Jules Verne in English was recently published by Butcher [1]). Most of them were scientific novels, announcing modern science fiction. However, following the strong suggestions of his editor Pierre-Jules Hetzel, Jules Verne promoted science in his novels, so that they could be sold as educational material to the youth. Jules Verne had no scientific education. He relied on popular publications and discussions with specialists chosen among friends and relatives.

Jules Verne was born in Nantes, where most of the manuscripts of his novels are now deposited in the municipal library. They were heavily edited by the publishers Pierre-Jules and Louis-Jules Hetzel, by Jules Verne himself, and (for the last ones) by his son Michel Verne.

This article briefly discusses how astronomy appears in the texts and illustrations of the *Voyages Extraordinaires*, concentrating on several examples among planetary science. Further information can be found in [2, 3].

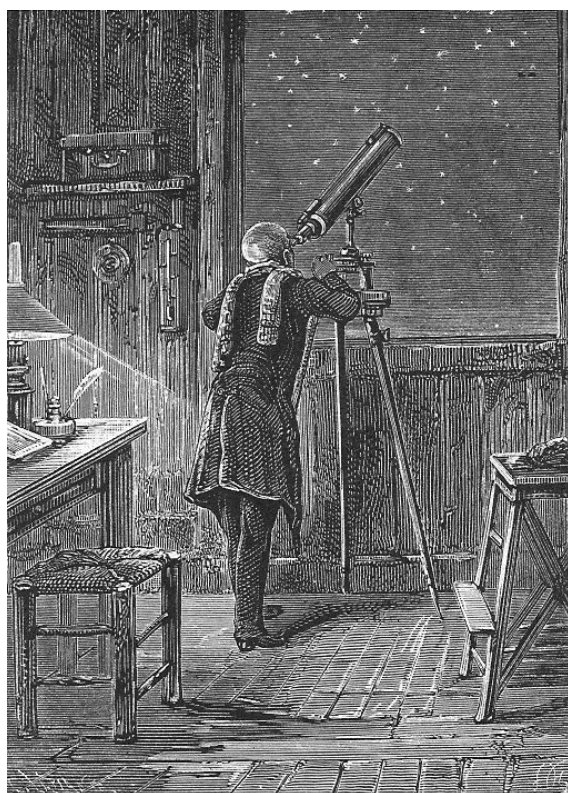


Figure 1: The free-lance astronomer Palmyrin Rosette at work in *Off on a Comet* (drawing by P. Philipoteaux).

### 2. Planetary science in Jules Verne's novels

*De la Terre à la Lune* (1865, *From the Earth to the Moon*) and *Autour de la Lune* (1870, *Around the Moon*) are probably the most famous novels on lunar exploration. Jules Verne required the advice of his cousin Henri Garcet (1815–1871), a professor of mathematics in Paris who published *Leçons nouvelles de cosmographie* [4], a textbook on astronomy which was popular for several decades. Garcet's former colleague Joseph Bertrand (1822–1900), a distinguished

mathematician and academician, also helped.

In *Around the Moon*, the projectile on its way to the Moon flies by a meteor, which is identified as the “second satellite of the Earth” of M. Petit. Indeed, Frédéric Petit (1810–1865), founder and director of Toulouse Observatory, studied the orbits of meteors and suggested that one of them could be a second satellite of the Earth. This hypothesis was soon abandoned due to the uncertainty on the determination of the orbit of such bodies. Jules Verne probably did not read the original reports of Petit (published in the *Comptes-rendus*), but took the information from the popular book of Amédée Guillemin (1826–1893) on the Moon [5].

*Hector Servadac* (1877, *Off on a Comet*) tells the voyage across the Solar System aboard a comet of a small community, including the free-lance astronomer Palmyrin Rosette (Fig. 1). It prefigures the Voyager missions of the NASA which flew-by successively several planets, as well as the ongoing Rosetta mission of ESA towards comet 67P/Churyumov-Gerasimenko. When working on this novel, Jules Verne reduced the orbital period of the comet — which crossed the orbits of Venus and Jupiter — to two years, in obvious contradiction with Kepler’s laws.

*Sans dessus dessous* (1889, *Topsy-Turvy*) reports a foolish attempt to tilt the rotation axis of the Earth, using the recoil effect of a giant cannon. The attempt fails, due to a miscalculation. The story is based upon a sound technical study [6]: Albert Badoureau (1853–1923), a mining engineer who lived in Amiens from 1884 to 1894, was commissioned (and paid) by Jules Verne to provide the scientific background of *Topsy-Turvy*. Indeed, one of the characters of this novel — Alcide Pierdeux — is sketched after Badoureau. The study of Badoureau was published in extenso, packed with formulas and scientific drawings, as the last chapter in the first edition of the novel.

*La Chasse au météore* (1908, *The Chase of the Golden Meteor*), a posthumous novel rewritten by Jules Verne’s son Michel (1861–1925), narrates the rivalry between two amateur astronomers who both discovered a bolid (in fact an asteroid). The asteroid (like the comet in *Off on a Comet*) is made of gold, and the announcement of its fall on Earth provokes a financial crisis. One can remark that the orbital elements of the asteroid (both those given in the original Jules’ version and the rewritten Michel’s version) do not fit with Kepler’s laws, as was the case for the bolid of

*Around the Moon* and the comet of *Hector Servadac*. One of the additions of Michel Verne to the original text of his father was the introduction of a new character. Zéphyrin Xirdal is an absent-minded scientist, not unlike Alcide Pierdeux in *Topsy-Turvy*. He used a device based on the equivalence between mass and energy to deviate the orbit of the asteroid. Michel had probably not heard of the new ideas of Einstein, which were hardly emerging at that time; he was rather influenced by the speculations [7] of Gustave Le Bon (1841–1931), a popular amateur physicist.

### 3 Conclusion

Jules Verne’s scientific novels inform us on how astronomy was understood by an honnête homme in the late 19th century. Their scientific content is of course outdated, but they can still be used in the classroom, as a lively introduction to the history of science.

### References

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