Galileo's first trial

It is well known that Galileo faced the Roman Catholic Inquisition in the 1630s because of his astronomical work. However, that was his second summoning, Nick Kollerstrom has the details of Galileo's little known first appearance before the inquisition.

As a mathematicus (meaning academic), the forty-year old Galileo Galilei was enjoying his safe post at the University of Padua in Venice. He'd been there for twelve years when he and his pal, Cremonini the philosophy lecturer, found themselves summoned by the Holy Office. The terms of the summons give us an intriguing glimpse into the early life of Galileo, before he had become famous. This matter has rather escaped the history books and has only came to light because some old archives had the dust blown off them in 1992 by a Franciscan Friar, Antonino Poppi – who was rather shocked by what he found.

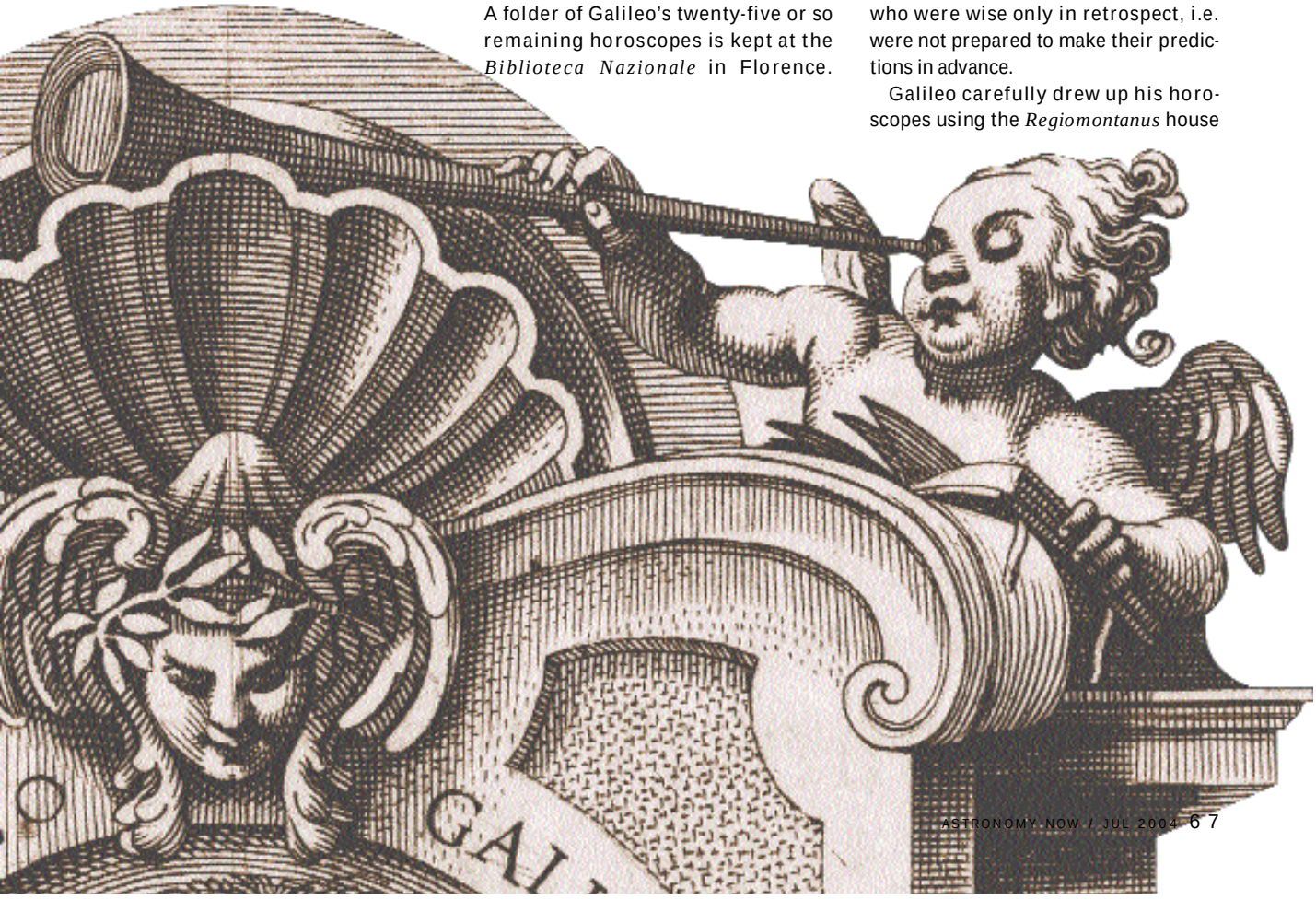
In those days, being a mathematicus meant involvement in what are – to us – the very different realms of astronomy, astrology and mathematics. The University of Padua had an especially strong tradition of 'medical astrology,' whereby doctors would learn to construct a horoscope for the time of onset of a disease, to judge its outcome. There are one or two letters from Galileo where he alludes to the fact that the majority of his students were medical. So, he could well have been expected to draw up a birth-chart for each of his students at Padua.

His horoscopes

A folder of Galileo's twenty-five or so remaining horoscopes is kept at the *Biblioteca Nazionale* in Florence. Unlike Kepler he never philosophised much about how or why astrology worked, it was just something he did and took for granted as part of his trade. Any patron who expected a horoscope to be drawn up and interpreted would not then have expected sceptical comments on the subject!

This was especially so for the Medicis he later came to work for, who were a dynasty that had always taken astral symbolism very seriously. We have no letters from Galileo expressing disbelief or scepticism concerning astrology, and the nearest he came to such was a scathing comment in his *Dialogues* concerning those *genethliaci* (astrologers) who were wise only in retrospect, i.e. were not prepared to make their predictions in advance.

Galileo carefully drew up his horoscopes using the *Regiomontanus* house



The second summons

Maffeo Barberini, who became Pope Urbain VIII, had earlier composed a poem about Galileo, comparing the latter to Cor Scorpionis, the red star Heart of the Scorpion. Barberini called the poem *In Dangerous Adulation* because he admired Galileo, but sensed that he would cause trouble.

Central to Barberini's tension was the question, 'Was Earth merely a planet, like the 'star' Jupiter?' The Church wanted to maintain the position that one could not have certain knowledge about such matters, whereas Galileo was arguing that he could.

It all came to a head when the Pope, who had no interest in whether the Sun moved, suspected that he had been cast as the obtuse character 'Simplicius' in Galileo's book *Dialogues*. Galileo felt certain that he had not done this, however he may not have sufficiently appreciated the effect of a certain sarcastic tone in his writings.

Also, in 1630 Galileo came to Rome with this great magnum opus completed, and enjoyed a dinner with his friend Abbott Morandi, evidently without realizing that the latter had just gone public with a prediction of the death of the Pope, based on the forthcoming solar eclipse! Morandi ended up dead in a Vatican jail later that year and Galileo found himself contaminated by the association.

A Jesuit gossip-column announced in May 1630, 'Galileo the famous astrologer is here' and made absurd claims of alleged predictions he had made about somebody having a baby, peace in Italy and the Pope's death.

At this key point in the birth of modern science – the publication of the *Dialogues*, which focused the great debate over whether the Sun moved – there was also great public concern over the astrological effect of an eclipse. Solar symbolism had been greatly used by the Pope in his regalia and at his inauguration, and many wondered whether the visible solar eclipse would portend his demise.

On the day of the eclipse, visible in northern Italy, the Pope performed certain magical rituals that he believed could successfully protect him from its malignity. Afterwards, in the wake of the Pope's recovery from the death-predictions, in 1631, a most severe Papal Bull against astrologers was imposed.

Galileo was an astrologer before he became an astronomer. Image courtesy: Royal Astronomical Society Library

system, which was fairly new and made out twelve equal divisions of the celestial equator. Although he lived in a time when tables for Copernicus' heliocentric Universe existed, they were not in general any more accurate than the old geocentrically based tables. It seems that the tremendous improvements in accuracy thanks to Kepler's innovations never quite reached Galileo. As a result, Galileo's horoscopes often contained errors. Mercury suffered by far the largest, being often out of place by up to three degrees.

His horoscopes thus used two different twelve-fold frameworks: the planets first positioned in zodiacal longitude in the tropical zodiac, with Aries representing zero, and then they were placed into 'houses' that were positioned with regard to the local horizon, which fixed their ascendant and descendent points.

Astral fatalism

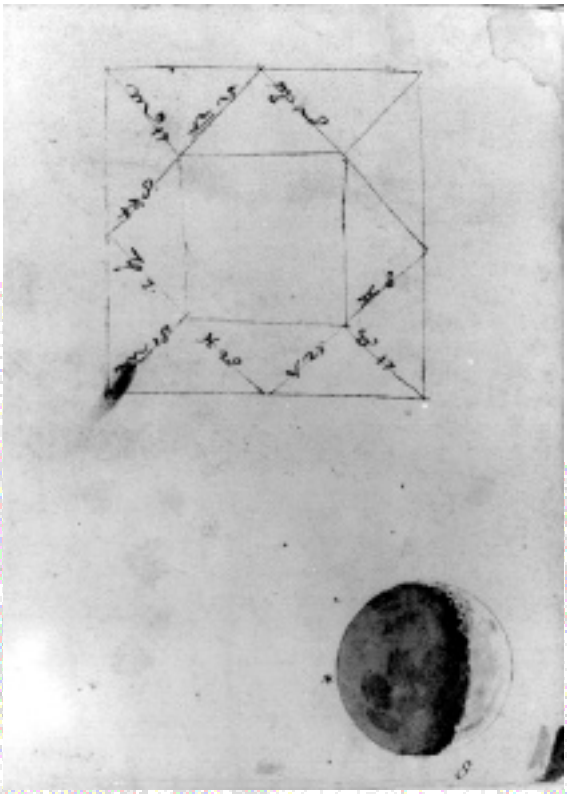
Sometimes, clients would arrive who did not know their date of birth but were requesting some guidance, and a horoscope would then be drawn up for when the question was asked; and a 'horary' or divination-judgement would be given. In Galileo's record-book for 1593-4 are notes of fees charged 'per sortem' and this Latin phrase alluded to that ancient practice. However, he stopped his diary-entry of these records after being 'shopped' by his amanuensis, Signor Silvestro. The latter had been employed at Galileo's household to take notes and transcribe Galileo's treatises concerning the military compass and other such matters for use by students.

Silvestro finished his employment there quite amicably it would seem; however, some months later his conscience impelled him to report certain issues to Venice's Holy Office.

Silvestro claimed to have heard Galileo

inform a client, during a chart reading, that he would die in twenty years' time. In fact, death-predictions were then very much a part of the astrologer's repertoire. Whilst the Church had no problem with astrology as such, it did have scruples about fatalism (the belief that certain events could be necessarily ordained). It seems that Galileo had been telling his clients that, because they could not avoid their fates as foretold by the stars, they might as well know about it.

There were several other charges brought by Silvestro. He also reported that Galileo would frequently row with his mother, and that he went to visit 'a Venetian whore' when he ought to have been attending mass. The rows with his mother seem to have focussed on this redheaded courtesan, Marina Gambio, who bore Galileo's three children. For good measure, Silvestro threw in that Galileo had the writings of Aretino on his shelves. Later banned by the church, Aretino's licentious tracts had brothel scenes, and one volume (now reprinted!) had advice from a prostitute to her daughter, about how to practice the trade. Silvestro insisted, however, that Galileo was not a heretic, and never expressed heretical views.



Galileo's sketch shows the first-ever exact lunar diagram and a first draft of his horoscope for the 18-year old Cosimo de Medici. Image: MicroFoto and Biblioteche di Firenze.

Heresy or hearsay?

It is nowadays difficult for us to appreciate what was so terrible about the concept of heresy (in England, people were burnt at the stake for it). Later on, the 'famous' trial judged that Galileo was 'vehemently suspected of heresy' – something that Galileo always repudiated.

In 1604, the judgement then reached was that he was guilty of 'living as a heretic.' His lifestyle was not what the Church expected from the venerable University's Mathematicus.

Regarding Cremonini, the Aristotelian philosophy lecturer at Padua, the Holy Office found him guilty of having taught 'mortalism,' i.e. that the soul did not survive death. This was heresy, whereas the charge against Galileo more concerned his lifestyle. However, the central charge on 22 April 1604 was that Galileo *had reasoned that the stars and planets necessitate*. This meant that the principles of scientific law, which Galileo was in those years formulating, involved the idea of necessary compulsion; that things had to behave in certain ways. Maybe the fatalism in his chart-readings was related to that.

These were, the Holy Office concluded, "charges of the utmost gravity." Yet, they were never pursued and the matter never reached Rome: Venice was a fairly liberal Dukedom and Galileo's university position protected him from any follow-up. In other words, he got off.

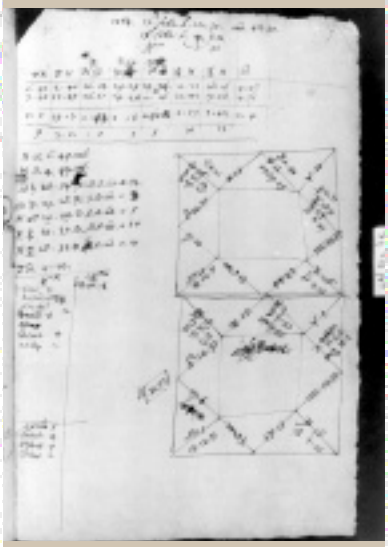
The Medici horoscope

A turning point in Galileo's life arrived in 1610, soon after he dedicated his newly constructed telescope to the Doge of Venice, so that they upped his salary. He yearned for an even better post, to become the Court Philosopher to the Medicis in Florence. This would relieve him of the drudgery of having to lecture to students. Whilst in the employ of the

Galileo's birth

Evidence for the date of Galileo's birth comes only from horoscopes that he composed for himself. Over the centuries, with the suppression of interest in this side of his life, no one was too sure on what date he was born. Two adjacent charts drawn up by him are shown, to which he evidently gave much care, indicating that he was born on the 16th, and not the 15th as commonly said. A fuller (but more agnostic) discussion by Noel Swerdlow on 'Galileo's Horoscopes' appears in the current *Journal for History of Astronomy*.

He was born in Pisa where days began at sunset; while in Venice where Galileo lived, they started at noon. The birth date here given was at what we would call 4 pm on the 16th of February (New Style) while in the old style it was at 22 hours of the 15th. These matters appear at the top of the horoscope, shown. He was evidently mulling over a half-hour difference in timing of his birth and one notes that the 'ascendant' differs from 14° to 21° in 'Leo.' The Moon's longitude differs by a few arcminutes between the two, but otherwise they are all the same. The sigyls (symbols) for the Moon, Sun, Mercury, Venus, Mars, Jupiter, and Saturn can be seen, plus there's a 'path of fortune' that is an arithmetic differential between Sun, Moon and ascendant longitudes. This told him where his good luck should lie! At the top he computed the longitudes from the tables, for each planet, summarized on the left together with celestial latitudes. He needed the latter for an (to us) obscure technique called 'primary directions', which was designed to give guidance over the course of a life.



In Galileo's astrological charts for himself, the two versions represent slightly different time-keeping systems. Image: MicroFoto and Biblioteche di Firenze.

Jargon busters

Fatalism
The notion that the future was somehow pre-ordained - and readable in a horoscope was called fatalism. The Church was concerned to uphold the notion of free-will, i.e. that a personal choice was always available, and so would from time to time object to any unduly fatalistic version of astrology.

Mortalism
This was the belief (from Aristotle) that the soul did not survive death.

Horoscope
A horoscope was that which was rising above the horizon (from 'hora', Latin hour), i.e. the ascendant.

Aspect
Angles were measured around the ecliptic in multiples of thirty degrees, e.g. sextile: a sixty-degree angle.

Medicis, Galileo made a sketch that seems to express the transition from one age to the next: the first-ever exact lunar diagram, showing terminator, lunar craters and Earthshine – so careful that science historians could date it precisely, to 19 January, 1610, using the star next to it – and a first draft of his horoscope for the 18-year old Cosimo de Medici. He was just completing his Starry Messenger (*Sidereus Nuncius*) that became a runaway bestseller, and had decided to dedicate it to the young Cosimo. The four new moons of Jupiter he named the 'Stella Medici' (He never called them moons because *Luna* was a proper noun and so could not have an 'e' added to it to make it plural). He explained in the foreword how Jupiter was strongly aspected at the young Cosimo's birth, being at the 'MC' or top of his chart, for which reason the four new stars belonged to the Medicis. His reasoning was accepted, and the four stars became a 'logo' for the Medici dynasty, celebrated in song, theatre, and opera, and within ceiling décor. Science historians have tended, however, to turn a blind eye to the astrological logic that underlay his dedication.

The foreword to his Starry Messenger held forth about the fine Jupiter-virtues that Cosimo received at his birth ('clemency, kindness of heart, gentleness of manners, splendour of royal blood,' etc) – explaining that the Maker of Stars had told him so! The foreword alluded to features of the Cosimo chart concerning Jupiter, but didn't specify its time or date, after all the chart of one's patron was a sensitive matter.

Horoscope-based character delineations made by Galileo of his closest friend Sagredo who lived in Venice, and of his two daughters Livia and Virginia, still survive today. Thus he drew up horoscopes and interpreted charts for those to whom he was closest.

Analysing the chart of Sagredo, Galileo discerned a 'lack of balance' owing to Venus' being the 'ill-balanced lady of the geniture, and the horoscope and the tenant of the horoscope' which broadly speaking meant that his having Venus rising in the earthy sign of Taurus tended to make him unduly pleasure-loving.

For his daughters, it was quite possible he was seeking reassurance over his decision to put his illegitimate daughters into a monastery for the rest of their lives, which he did when they were just 14.

Galileo's observations of Jupiter's moon confirmed his becoming an astronomer and leaving astrology behind. Image: NASA

Find out more

A special issue of 'Culture and Cosmos, a Journal of the History of Astrology and Cultural Astronomy' all about 'Galileo's astrological universe': Vol. 7 no 2, ISBN 1-898485-09-7, has been published. For details see: www.cultureandcosmos.com

Dr Nick Kollerstrom is a historian of astronomy at University College, London. His particular research interests are Newton's lunar theory and the discovery of Neptune. He is a founder member of the Society for History of Astronomy. He gave a paper on 'Galileo's astrology' at the Galileo 2001 Eurosymposium.

In October 1604 a new star appeared in the sky that became known as 'Kepler's Star'. It caused a revolution of thought because the heavens were not supposed to change. A popular series of lectures Galileo gave about it marked his debut as an astronomer. It was also the last time (so far!) a supernova has been seen in the Milky Way. *Astronomy Now* and Nick Kollerstrom will return to this second part of the story later in the October issue when we celebrate 400 years of Kepler's supernova.