# »Again, the Earth (which ever I held in mine eye) did as it were mask it selfe with a kind of brightness like another Moone.«

## Inventing ›Blue Marble‹ in 17th century literature and astronomy[1]

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### Defining Celestial Sublimity

Even though *Blue Marble* (fig. 1) did not appear on the front-pages of international newspapers and magazines in 1972, the majestic image of the full Earth's globe shot at a distance of only 45,000 km and published by NASA shortly after the safe return of Apollo 17 is one of the most famous space photographs ever taken. Its degree of popularity may only be matched by the equally famous picture of *Earthrise*, taken by chance by the astronaut William Anders during the Apollo 8 mission on December 24th 1968.[2] Nevertheless, it was *Blue Marble* that became »the image of the Earth par excellence,«[3] as Horst Bredekamp recently coined it, last but not least due to its omnipresence in mass media within the political context of the growing ecological and antinuclear power movement in the 1970s, where it instantly became a powerful symbol of Earth's fragility. The image was soon so well-known that in the years following

**1** | This paper is part of a larger study on *Exploring outer space. Literature and Astronomy (1593 and 1771)* that will be published in Winter 2017/18. I am grateful to Solvejg Nitzke and Nicolas Pethes for the opportunity to present some of my arguments in this volume.

**2** | Cf. Poole 2008.

**3** | Bredekamp 2011, 221.

its first publication expressions were born such as »Erdsicht,«[4] the German term for a view of the Earth as seen from a non-Earthly – that is to say, cosmic – viewpoint, as well as »overview-effect,«[5] which defines the emotional impact of ›Erdsichten‹ as an unexpected and sudden feeling of being ›swept off one's feet‹.

*Fig. 1: Blue Marble (digitally enhanced)*

The overwhelming effect, supposedly a natural and therefore ›true‹ reaction to these images, is not so much indicated by the *compositum* itself, even though it speaks of an effect, but by the notably successful coping strategies implemented in the aesthetics of *Blue Marble* itself. These have been dominating the global media images of ›Erdsichten‹ ever since, while at the same time they follow an aesthetic choreography outlined in the 18th century to field the sudden view of a stupendous nature such as the tremendous Rhine Falls at Schaffhausen or the frightfully ice crusted mountain massif of the Mont Blanc. Being overwhelmed by nature – or

**4** | Cf. the correspondent lemma in *Outer Space* (ed. Kunst- und Ausstellungshalle der Bundesrepublik Deutschland) 2014, 50.

**5** | The expression »overview-effect« was first used in 1987 in the title of a book by Frank White based on the stories of 29 astronauts, among them Alexejewitsch Gagarin and Alan Shepard, remembering their ›first encounter‹ with the Earth viewed from outer space. (White 1998).

to put it more correctly, being overwhelmed by the unpredicted perception of a stunning natural phenomenon – is not very different from the experience of ›Erhabenheit,[6] by which the 18th century found a powerful answer to the internal sentiment of the sublime, propagating the aesthetic as well as sacral dimension of its external ›natural‹ cause. Following the well-known definition by Friedrich Schiller at the beginning of his essay *Vom Erhabenen* (1793), ›Erhabenheit‹ means to become aware of the double-bound relation a human being maintains with nature, being part *and* counterpart at the same time. Following Schiller – and up to a specific point also Kant and his concept of ›Erhabenheit‹ outlined 1790 in his *Kritik der Urteilskraft* (»Critique of Judgement«) –, the confrontation with a stupendous and threatening, even though distant, natural phenomenon sets human beings at the interface of nature and culture, thereby evoking the simultaneous sentiment of dependency and autonomy, ›Ohnmacht‹ (*impotence*) and ›Ermächtigung‹ (*empowerment*). It is this ambiguity towards the natural that enables the subject to rise above nature while externalizing its cause by the means of reason:

> *Sublime* we name an object, at whose conceptualization our sensuous nature feels its limits, but our rational nature its superiority, its freedom from limits; in the face of this we thus derive *physically* our brevity, which we surmount but morally, i.e. through ideas./Only as sensuous beings are we dependent, as rational beings we are free.
>
> The sublime subject matter gives us *firstly*, as beings of Nature, to feel our dependence, while *secondly* acquainting us with the independence that we as rational beings maintain over Nature, *within* ourselves as well as *without* ourselves.[7]

**6** | I prefer the German expression ›Erhabenheit‹ as it was defined by Schiller and Kant in the 1790s in contrast to English concept of the sublime that was invented by Edmund Burke in *A Philosophical Enquiry into the Origin of Our Ideas of the Sublime and Beautiful* in 1756. For further distinctions see the lemma »Erhaben, das Erhabene« in Homann/Müller/Tonelli 1972.

**7** | The German original reads as follows: »*Erhaben* nennen wir ein Objekt, bey dessen Vorstellung unsre sinnliche Natur ihre Schranken, unsre vernünftige Natur aber ihre Überlegenheit, ihre Freiheit von Schranken fühlt; gegen das wir also *physisch* den Kürzern ziehen, über welches wir uns aber *moralisch* d. i. durch Ideen erheben. Nur als Sinnenwesen sind wir abhängig, als Vernunftwesen

In the eyes of late 18th century viewers, the adequate answer to the experience cited above was to sublimate the emotional paradox by aestheticizing its natural cause and transcending it into an object worthy of admiration. *Blue Marble* not only proves the still powerful impact of this specific aesthetic program, it also tells us that the experience of ›Erhabenheit‹ is not necessarily restricted to nature itself, for it applies to man-made reproductions of natural phenomena as well. In 1972, the visual code of *Blue Marble* set the patterns for a cosmic image of the globe that was still to come. It pictured the Earth as a perfectly round three-dimensional sphere brightly gleaming against the pitch black background of a frightfully empty cosmic space, dressed in the royal colors of blue and green, coated by some white hazes and interspersed with just enough patches of brown needed to remind its beholders of the familiar materiality that gave Earth its name.

Descriptions by astronauts repeat, that being exposed to this view for the very first time, they experienced a sudden and unexpected revelation of a submissive and almost religious admiration, which comes very close to Schiller and Kant's concept of ›Erhabenheit‹. With only a few adjustments the aesthetic paradigm of the sublime has been incorporated in the image of *Blue Marble* to a degree that even more than 40 years later it is still largely unknown, that the picture we know is *not* the picture taken by Harrison »Jack« Schmitt through the bull-eye of Apollo 17 on

sind wir frey./Der erhabene Gegenstand gibt uns *erstlich*: als Naturwesen unsre Abhängigkeit zu empfinden, indem er uns *zweitens*: mit der Unabhängigkeit bekannt macht, die wir als Vernunftwesen über die Natur, sowohl *in* uns als *außer* uns behaupten.« (Schiller 2008, 395). Schiller's essay is at the same time an answer to Kant's concept of ›Erhabenheit‹ outlined 1790 in Part II of the *Kritik der Urteilskraft*. He deepened his theoretical discussion of the sublime in his subsequent essay *On the Sublime* (first published in 1801). Here, the sublime is differentiated further from the moral: »In the presence of the sublime, on the contrary, reason and the sensuous are not in harmony, and it is precisely this contradiction between the two which makes the charm of the sublime – its irresistible action on our minds. Here the physical man and the moral man separate in the most marked manner; for it is exactly in the presence of objects that make us feel at once how limited the former is that the other makes the experience of its force. The very thing that lowers one to the Earth is precisely that which raises the other to the infinite.« (Schiller 1902, 141).

that famous day December 7th 1972 at 10:39 UTC. To facilitate spatial orientation, to enhance the public's ability to visually identify with the image, and to create a powerful impression of authenticity, Schmitt's photograph was turned ›downside up‹. I in order to match our familiar system of cardinal points, we now see the cloud covered South Pole in the south, Madagascar in the east and northern Africa in the north (fig. 2).

*Fig. 2: Full Earth showing Africa and Antarctica taken on December 7, 1972 at 10:39 UCT by Harrison Schmitt on board of Apollo 17 (original position)*

In addition, the brightness and colors of Earth were technically enhanced to stimulate the effect that the planet seems to float from the deep black space towards us, her contemplating inhibitors. By means of disjunction, *Blue Marble* became in its perfect proportional harmony the ultimate evidence that the universe itself obeys the rules of beauty. Also mostly forgotten is the fact that *Blue Marble* was not at all the first space photograph of Earth. In 1969, Neil Armstrong and Edwin Eugene Aldrin had shot several spectacular pictures of the Earth while standing on the Moon's surface, some of which are quiet well known. And even prior to those images, ATS I and II satellites had already produced half a dozen serials of Earth photographs, including some full shots. As a glimpse in the online database *ATS-II Image Collection* at the Schwerdtfeger Library of the University of Wisconsin-Madison reveals, 69 full

picture shots had been taken in the period between November 10th 1967 and March 21st 1969.[8] And not even those were the first photographic ›Erdsichten‹, since the first cosmic photograph of Earth had already been shot by *Lunar Orbiter 1* on August 23rd 1966 (fig. 3). But in contrast to *Blue Marble,* all those pictures never managed to capture the Earth without being partly shadowed by the Moon.

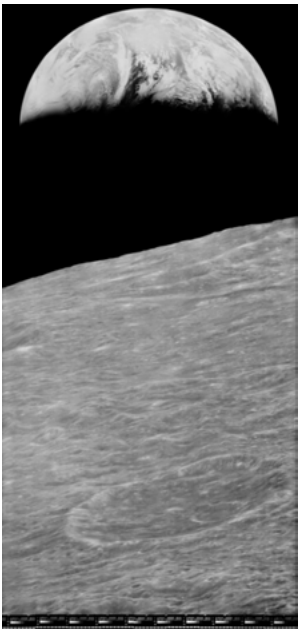

*Fig. 3: Earth floating in space taken by Lunar Orbiter 1 on August 23rd, 1966 (digitally enhanced recovery by the Lunar Orbiter Image Recovery Project in 2008)*

Nonetheless, all these photographic images make one thing clear: They show the tremendous importance of human perception in the concept of ›Erhabenheit‹. It is not the photographed object itself that evokes the sentiment of the sublime; it is the fact that the photograph in person proves the Earth's appearance while transforming it into an aesthetic object. In other words, the fundament of the sublime is human eye witnessing, the fact that while looking at *Blue Marble* we can say: »Wow,

**8** | Cf. Schwerdtfeger Library 2015.

this is how Earth *really* looks and we know it because someone had seen it *just like this*«. This is why a more than 40-year old photograph of Earth is still met with awe; and this is why it seems as if Schmitt with his famous and unrivalled picture had given humankind the very first image of its home planet.

Yet the theatrical, and of course also sexual, metaphor of ›the first time‹ that occurs in almost every article about *Blue Marble*[9] hides the fact that like Schmitt's picture and its visual improvement according to the aesthetic concept of ›Erhabenheit‹, the twentieth-century image of Earth seen from outer space is neither maiden-like nor new. It is the picture itself that reveals the long aesthetic history of imaginary Earth sights that goes back as far as early 17th Century and of which *Blue Marble* is just a very prominent example. A tradition so influential that seen from the backdrop of visual and literary history, *Blue Marble* becomes a subsequent evidence of a visual and rhetorical invention leading back to times when manned space flight was still a dream. The importance of early modern anticipations of the cosmic view and its impact on today's images are the main subject of my article. And as I will show in the course of my argument literary imagination especially played an important role by creating what we perceive as our visual knowledge of our cosmos.

## Inventing the Cosmic Eyewitness

The history of ›naturalistic‹ space images of Earth begins with Francis Godwin's novel *The Man in the Moone or a Discourse of a Voyage thither.*[10] First published in 1638 under the pseudonym of its protagonist Domingo Gonzales, its author, the Bishop of Llandaff and Hereford, had been dead for almost six years. Despite the pseudonymous publication, he was soon revealed as the originator; the second edition of that same

**9** | I refer once again to the publication of Bredekamp, who stresses the fact that mankind had never seen Earth before in this way and that sight of *Blue Marble* altered the understanding of the Earth as our home planet fundamentally and proved to be of major importance for the newly founded ecological movement. Cf. Bredekamp 2011, 371f.

**10** | Gonsales [alias Godwin] 1638.

year already carried his given name. Translated into French in 1648 in a strongly modified, if not to say corrupted version[11], Godwin's novel became the decisive founding narrative of early modern science-fiction with two more English and three more French editions in the 17th century followed by translations into Dutch in 1651[12], German in 1659[13], and Spanish before 1731.[14] In 1718 altogether 12 continental and 4 English editions had appeared; not counting the misprints, abridged and corrupted versions as well as the unofficial serials that circulated among the European erudite elites.[15]

*The Man in the Moone* tells the adventurous space travel undertaken by chance in the late 16th century by a picaresque though educated Spaniard »of noble parentage«[16] named Domingo Gonzales who serves as protagonist, narrator, and author of his cosmic ›road novel‹. Being accidentally stranded on Tenerife, Gonzales tries to escape with the help of a flying engine drawn by a flock of tamed geese (fig. 4). Much to his surprise he finds himself not drawn to the coast of Spain, but the Moon.

**11** | The French translation by Jean Baudoin excised first and foremost the narrative's sections on the Christian belief of the Lunarians. Cf. Godwin 1648.

**12** | Godwin 1651.

**13** | Godwin 1659. Due to the printer, the Nürnberg family Felßecker, the German translation was wrongly dedicated to Hans Jakob Christoffel von Grimmelshausen until 1924. The true translator is not yet identified; characteristics in style and wording indicate it might have been Balthasar Venator.

**14** | I can only give an indirect and imprecise dating based on the French edition by Antoine De Heuqueville in 1731 that in turn refers to a Spanish edition. Unfortunately I haven't achieved to find a copy or the original of the first Spanish translation yet.

**15** | For a detailed account on the publication history cf. Janssen 1981.

**16** | Gonsales [alias Godwin] 1638, 1.

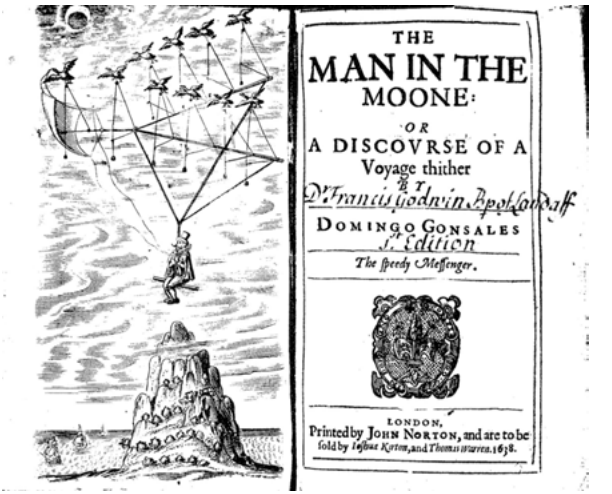


*Fig. 4: Frontispiece of the first edition of Godwin's »Man in the Moone« (1638)*

But much to his surprise he finds himself not drawn to the coast of Spain, but to the Moon. Because his escape from the island by chance coincides with the habit of his »gansas«[17] to hibernate on the Moon, he is carried into space involuntarily. During his unanticipated celestial journey, Gonzales witnesses a whole range of physical and astronomical phenomena related to a cosmic order that is unmistakably based on the writings of Johann Copernicus and Johannes Kepler, who are mentioned by name[18], as well as of Galileo Galilei, to whose *Sidereus Nuncius* Gonzales alludes several times.[19] While travelling through space he recalls their theories, which, of course, he knows by heart; thus substantiating by his own eyesight some of their most debated hypotheses such as the coldness of cosmic ether, the perpetual self-rotation of Earth, and the slanted position of its axis.[20] But having left orbit behind and looking down on Earth, Gonzales stunningly perceives the globe's cosmic shape and bright appearance from far above:

**17** | Ibid., 36.

**18** | Cf. Ibid., 53 and 60.

**19** | Gonzales's novel furthermore includes aspects of William Gilbert's theory of magnetism and a pre-Cartesian concept of ether.

**20** | Cf. Ibid., 53-56.

Again, the earth (which ever I held in mine eye) did as it were mask it selfe with a kind of brightness like another Moone; and even as in the Moone we discerned certain spots or Clouds, as it were, so did I then in the Earth. […] I should at first see in the middle of the body of this new starre a spot like unto a Peare that had amorsell bitten out upon the one side; after certaine howers, I should see that spot slide away to the *East* side. This no doubt was the maine of *Afrike*./Then I should perceive a great shining brightness to occupy that room, during the like time (which was undoubtly none other then the great *Atlantick Ocean*). After that succeeded a spot almost of an Ovall form, even just such as we see *America* to have in our Mapps. Then another vast cleernesse representing the *West Ocean*; and a lastly a medly of spots, like the countries of the *East Indies*.[21]

With *Blue Marble*, Gonzales' description shares not only the qualities attributed to Earth's outer appearance (e.g. first and foremost its shining brightness of an even form occasionally covered with clouds and partly riddled with some patches of Earth rightfully identified as the continents), but it also shares the mode and spatial position of perception itself. Like Harrison Schmitt, Godwin's protagonist is situated some one thousand miles above the Earth's surface, looking straight down on the globe below him. And like him, he does not leave her out of sight – »(which ever I held in mine eye)« – knowing that by watching Earth from a point of view somewhere in the empty cosmic space between the Earth and the Moon for the first time, he is not only describing the appearance of a »new starre«, but he is responsible for its discovery, if not to say for its performative ›birth‹.

The exactness of his account as well as the emphatic description of the observation itself and its circumstances therefore give evidence to the truthfulness of the perception and unmask Gonzales as a narrator who is conscious of the imaginative power his cosmic picture will have on his readers. In doing so, labelling the Earth a *star* doubtlessly underlines the theorems of the *nova astronomia* which proclaimed the truth of Copernican order, including the equivalence of all celestial bodies moving directly around the sun. But labelling her a *new* star – a proposition that makes no sense whatsoever, given the fact that the Earth is not only the oldest celestial body, but also the most familiar to mankind – shows that he is well aware of his own narrative power; his visual evidence of the Earth's

**21** | Ibid., 56f.

appearance and position in the modern Copernican space is based on the conviction that from now on she will never be seen in the same way.

Still, there is one obvious distinction between *Blue Marble* and Gonzales' ›new star‹ which has to do with the media differences between a photograph and a narrative. In contrast to *Blue Marble* (1972), the ›Blue Marble‹ (1638) moves, and it moves in a very distinctive way:

> So that it seemed unto me no other than a huge Mathematical Globe, leisurely turned before me, wherein successively, all the countries of our earthly world within the compasse of 24 howers were represented to my sight.[22]

If this were a quotation from a twentieth-century novel, one would classify it as a typical reference to cinematic narration; but being taken from a novel that was written almost 400 years ago, the appropriate media reference doubtlessly is not film but early modern cartography. The importance of cartography becomes even more obvious as Gonzales directly refers to his media precursors when he parallels his view with that of »our Mapps« and compares the celestial body of the Earth floating in space to that of a »huge Mathematical Globe«.

## Depicting the Earth as Another Star

Early modern globes were the first media artefacts presenting a full view of Earth from a distant point of observation. With the invention of the refracting telescope by Hans Lipperhey between 1606 and 1608[23] and its use within the astronomical studies of Galileo Galilei in 1609[24], not only the cartographic knowledge incorporated in celestial globes improved, but in terrestrial ones as well. In seafaring, for instance, telescopes were used to scrutinize coastlines and other prominent geographical features such as solitary mountains or mountain ranges. The most sophisticated example in the early days of telescopic perception

**22** | Ibid., 57f.

**23** | Lipperheys assertion of creatorship was immediately challenged by similar assertions from his fellow Dutch spectacle-makers Adriaan Metius and Zacharias Janssen. For the 17th-century debate cf. Borel 1655 [1656].

**24** | Cf. Mann 2000 and Schmitz 1982. For Galileis telescope(s) cf. Learner 1991.

is the elaborate cartographic oeuvre of Willem Janszoon Blaeu. Blaeu had studied with Tycho Brahe and worked as an astronomer before he became the official cartographer of the *Vereenigde Oostindische Compagnie* (VOC) in 1633, at that time the most prestigious cartographic position in the Netherlands. In cooperation with his son, Joan Blaeu, who would eventually succeed him to the post at the VOC in 1638, Willem Blaeu, who had bought several printing plates from the inheritance of Jodocus Hondius (who himself had been in the possession of the printing plates of Mercator), published the first edition of his famous *Atlas novus* in 1634. It later became known as the *Atlas Maior*[25]; its 1662 edition was the most expensive book printed in seventeenth-century Europe containing almost 600 maps and 3000 pages of descriptions.[26]

The intellectually and technically unparalleled maps of Willem Blaeu were superseded only by those of his son. In 1648, Joan Blaeu published the first world map that took Copernican astronomy into account, thereby replacing the map his father had drawn 43 years earlier. His *Nova et Accuratissima Terrarum Orbis Tabula* (fig. 5) depicted the celestial order in accordance to the heliocentric system of Copernicus. While the two hemispheres of Earth are displayed in the characteristic manner of an open book, thus paralleling once again the reading of *scriptura* with that of nature, the upper margin shows an allegorical system of the then known planets with Apollo sitting in the center and Mercury, Venus, Earth (accompanied by the Moon as a small cherubim figure in the gap between the two hemispheres), Jupiter, Mars, and Saturn devoutly turning around him. The figures of an astronomer and a geographer armed with their typical instruments, an armillary sphere and a circle for measuring the Earth, who are displayed at the far left and far right margin of the map, transform the engraving of Earth's surface into an elaborate demonstration of the whole cosmos, including the scientific techniques of its perception and construction.

**25** | The first edition of the *Atlas* was published in 1634 in a very small number. It contained 60 maps, from which 37 were taken from Hondius. An augmented edition appeared in 1635 under the full title *Theatrum orbis terrarum, sive, Atlas novus*. For the history of early modern cosmographic knowledge cf. Vogel 2006.

**26** | Joan and Willem Blaeu 1662. The *Atlas maior* was translated into French, Dutch, German and Spanish. Cf. the article on the Blaeu family in Kupčík 2011, 93-107.

*Fig. 5: Joan Blaeu's Nova et Accuratissima Terrarum Orbis Tabula (1648; ED 1662)*

In doing so, Joan Blaeu's cartographic (re)presentation of Earth is the first example of an early modern visualization that takes into account our planet's decenterd astronomical position in space. Nevertheless, it still remains a depiction not only taken from a point of view close to Earth's surface but one altogether uninterested in her cosmic appearance. The major difference to Godwin's description, even though his protagonist cites the importance of »our Mapps,« lies in this divergent ›Bildinteresse‹ (the image's intention) between a cartographer and a space traveler *avant la lettre*. Whereas Gonzales is fascinated by the Earth's appearance as a »new star,« that is to say as a celestial body among other celestial bodies within the universe, the ›Bildinteresse‹ of Blaeus *mappa mundi* focuses on the most accurate geographical (re)presentation of the Earth's constitution, primarily with the exact reproduction of its continents and islands. This was partly due to the buyers of his works, mostly wealthy Dutch trading merchants with a global perspective of the world that fit the global depiction in Blaeu's maps, and partly due to the entirely different impact of knowledge that separated those interested in geography from those interested in cosmography.

Until the early 17th century (re)presentation of the cosmic order had been strictly reduced to the Christianized version of Ptolemy's *Megalé Mathēmatikē Syntaxis*, better known as *Almagest*.[27] The cosmographic

**27** | Probably the best example for a Christianized Ptolemaic astronomy of late 16th century is Apian 1574.

order of space began to change with the growing acceptance of Copernicus' and Kepler's astronomical theories in the course of the 17th century, thus giving way to a more accurate and elaborate depiction of the universe. In general, cosmography certainly owed more to the invention of the telescope than cartography, and as is undoubted, that the telescope enabled cartographers to see better what they could see already, in the realm of cosmography it created a whole new world to be observed, ordered, and displayed for the first time ever. It is therefore no wonder that from the mid-17th century onward celestial atlases and globes experienced a remarkable rise as mediators and illustrators of the new astronomical knowledge.

Andreas Cellarius' *Harmonia macrocosmica seu Atlas universalis et novus*[28] appeared in 1660 and is one the most famous cosmographies of the 17th century. It contained 350 pages as well as 29 extremely elaborately engraved and artfully colored double-page copperplates by Jan van Loon and was published by Jan Janszoon, who ran the leading Dutch (if not European) publishing house for cartographic imprints and globes. The celestial atlas is divided into three chapters: Chapter A depicts the main world systems beginning with Ptolemy and ending with Tycho Brahe including the first ten engravings; Chapter B presents the next ten engravings picturing the most important details of the astronomical order of the solar system beginning again with Ptolemy and ending with Tycho Brahe; Chapter C finally includes the last eight engravings and is dedicated to mostly Christian astrological constellations. Even though the Dutch atlases and globes printed by Janszoon and Blaeu set the technical standard and defined the aesthetic norms for the visual capturing of cosmic space in early modern Europe, cosmographies such as Cellarius' *Harmonia macrocosmica* were first and foremost targeted at a public that enjoyed gloating over the skillful engravings while adapting the well instructed explanations. The atlas was not intended for scientific use by professional astronomers. In fact, Cellarius' cosmography was not at all well received among the erudite astronomy of the day. Athana-

**28** | Cellarius 1660. For further technical information see the commentary by Robert van Gent in his facsimile edition. (Cellarius 2006).

sius Kircher[29] and Christiaan Huygens[30] criticized the complete lack of astronomical calculation tables, further pointing out that the celestial maps were also less accurate even than those in Johann Bayer's *Uranometria* from 1603. In addition, Huygens observed that the astronomical knowledge distributed was in no way up to date, i.e. recently made discoveries such as Galileo Galilei's four Jupiter Moons from 1610, his own telescopic observation of the rings of Saturn and its Moon from 1655 and Johann Hevelius' cartography of the Moon's surface from 1647 just as the newest results in mathematical astronomy outlined by Johannes Kepler[31] were missing or only taken into account marginally.

Nevertheless, the last plates of Cellarius' cosmography are striking for the topic of this article. While the engravings in the first chapter present distinctly schematized views of different concepts of cosmic order and the rotation of the celestial bodies[32], and while the various stellar constellations of the second chapter are depicted in richly decorated figurative illustrations, the last engravings offer a different perspective. Here, Earth is displayed in a so-called orthographic observatory projection. Orthographic projections, or orthogonal projections as they are also called, project three-dimensional bodies onto a two-dimensional surface using a perspective that is similar to a photograph shot with a telephoto lens from very large distances – for instance, 45,000 km above Earth. The impact on the beholder of

**29** | Despite his criticism, Kircher recommended the publication for the collection of the *Collegium Romanum* in a letter to the *Seminario Romano* on July 4th in 1660. In the same letter he also voted against the atlas being set on the *Index Librorum Prohibitorum*. Cf. Cellarius 2006.

**30** | For Christiaan Huygens see his last publication dedicated to his brother Constantijn (Huygens 1698). Cf. also van Helden 1980 as well as articles based on the Nantes symposium on »The Jovian System after Galileo. The Saturnian System before Cassini-Huygens«. (Gautier [ed.] 1999/2000). For the general background on early modern astronomy cf. Donahue 2006.

**31** | E.g., for aesthetic reasons the majority of the depicted planets' orbits is perfectly circular, which was wrong astronomically as Kepler had shown in 1609 in his *Astronomia Nova ΑΙΤΙΟΛΟΓΗΤΟΣ seu physica coelestis*, and not elliptical, which would have been correct, but aesthetically would have been less attractive.

**32** | With the exception of plates #2 and #4 that combine a week orthographic projection with a schematized presentation.

the *Harmonia macrocosmica* is evident. After having become familiar with the pros and cons of the Ptolemaic, the Copernican, as well as the Tychonic cosmic systems in chapter one and an expert in the details of astronomic observation in chapter 2, the now well trained reader looks straight down onto Earth from a fixed point in cosmic space and through various stellar constellations that unfold below him in a richly ornamented pictorial manner. As seen exemplarily in plate 25, *Hemisphaerii borealis coeli et terrae sphaerica scenographia* (fig. 6), the etching's composition forces the viewer to penetrate the densely populated spherical circle of the universe until his/her eye reaches Earth's globe floating in a perfectly round space. Beneath the colored crowd of animals, mythological figures, astronomical instruments and other ›objects,‹ the viewer can detect Earth's northern hemisphere with the coastline of northern Africa turned towards the spectator. The multi-layered cosmic space that unfolds figuratively in the last five engravings of Cellarius' *Harmonia* comes close to the cosmic image of Earth outlined in Godwin's *Man in the Moone*.

*Fig. 6: Andreas Cellarius Harmonia macrocosmica (1660). Plate 25: Hemisphaerii borealis coeli et terrae sphaerica scenographia.*

But in contrast to Gonzales' literary autopsy, that excluded any encompassing description of space itself, Cellarius' depicts the universe as a limited three-dimensional sphere, which has the same clear contours and perfectly round shape as the body of Earth's globe it contains. At first glance, Cellarius' ostensible point of view therefore seems to be even

more artificial than the one incorporated by Gonzales, because it refers to a position that is not just situated somewhere above Earth, a position that was at that time clearly fictional in itself, but outside the whole universe; in other words, a position that can only be imagined as either godlike or non-evident.

The astronomical perception provided by orthographic projection threatens to undermine the scientific impact nevertheless intended by Cellarius and Janszoon, if it were not surrounded by equally skilfully designed margins. As soon as they are taken into account, the full complexity of the viewer's gaze set out in this engraving unveils, because it unmasks the alleged transcendental viewpoint as the result of two entirely incongruous perspectives conflated in a visual simultaneity. With regard to Earth's position, the point of the beholder's perception moves even farther away from the planet than that of Gonzales, while at the same time this view-point remains strictly terrestrial in regard to the stellar constellation. This simultaneous display of two different points of observation explains why we perceive Earth floating in space with the cosmos encompassing and protecting it like a celestial womb while, at the same time, the latter mirrors the astronomical gaze into the sky of the northern hemisphere – the same gaze of the group of astronomers who can be identified as the visual guides of the celestial order presented in this etching standing in the lower left and right corners of the margins. By means of astronomical observation working in tandem with astronomical imagination, the beholder of Cellarius' *Harmonia macrocosmica* is enabled to be on and above Earth at the same time. By doing so, the viewer simultaneously incorporates a fictitious and a factual viewpoint without any difference.

## Narrating Earth Within Cosmic Order(s)

The view of Earth from outer space Godwin invented was gratefully adapted not only by the makers of early modern cosmographies, where it became the stepping stone for a new pictorial semiotic of space as Cellarius' example has illustrated. This view was even more appreciated in the realm of literature. One does not exaggerate in claiming that Gonzales' description of his voyage to the Moon marked the birth

of the new literary genre of early modern science-fiction[33], which increased remarkably beginning in the mid-17th century.[34] Besides auto-diegetic narration with the main character simultaneously serving as the protagonist, narrator, and author (and sometimes even editor), structural elements such as initial astronomical hypotheses waiting to be empirically proved, the extrapolation of scientific knowledge into new ›realities‹, the exact description of the preparation and execution of space explorations, and the detailed matter-of-fact portrayal of observed celestial phenomena have remained part of the generic narrative framework of science-fiction since that time.

The first evidence of a direct reception is found in Cyrano's *Les États et Empires de la Lune*, published posthumously in 1657.[35] The topos of Earth seen from outer space as it is outlined in the *Man in the Moone*, and the aesthetic and astronomical dimensions of which are still present in our popular cosmic imagination *Blue Marble*, is iterated in this first French early modern space travel. However in contrast to Gonzales Dyrcona, as the novel's auto-diegetic protagonist is called in an obvious anagram of Cyrano de Bergerac himself[36], he undertakes his journey to the

**33** | A short, but complete overview on the discussion of when to date the beginning of SF and how to define its most prominent features is given by Roberts 2006. Godwin's impact on early modern SF is among others discussed by Nate 2001, 120-129.

**34** | With Godwin's novel as starting point, a hundred years later there were already more than 100 outer space narrations published in England, France, and Germany. For the 18th century cf. Gove 1961.

**35** | It was supposedly written in the late 1640s/early 1650s together with its second part, the twin novel *Les États et Empires du Soleil*. Both were published two years after Cyrano's death by his friend Henry Le Bret, who then became secretary of the archbishop of Montauban, later chief provost of the cathedral of Montauban. Le Bret generously ›altered‹ the original manuscript censoring sequences that were offending catholic doctrines such as the privileged position of the Earth and human mankind within God's creation. For the publication history of Cyrano's novels cf. Cyrano 2006, ci-cl. For further reading on Cyrano's philosophical thinking cf. Alcover 1970; Blanchot 1962; Darmon 2002 as well as Romanowski 1998.

**36** | The name is first displayed at the beginning of the second novel *Les États et Empires du Soleil*. (Cyrano 2006b, 175).

Moon voluntarily. His first aim is to eyewitness the alleged astronomical equivalence of the Earth and Moon.[37] He succeeds by using a rocket-like flying engine for his trip into space, whereupon he then aims to prove that the sun is inhabited like the Earth and Moon. For this purpose, he undertakes a second journey enhancing the visual experience of the first, during which he had been too occupied mastering his flying engine to notice the details of the Earth's globe underneath him. Dyrcona doesn't realize the Earth's cosmic appearance until it is nothing more than »a huge golden plate«[38]. As an experienced traveler, he is not only able to reflect on the general challenges of space exploration, he also gives detailed evidence to his initial hypothesis of Earth's rotation and the Moon's alikeness. Dyrcona's second report seizes Gonzales' description of the Earth's appearance in many aspects even though Gonzales' noticeable aestheticization is substituted by a matter-of-fact description that privileges observational evidence to the astronomical hypothesis in question rather than to outline its aesthetic components. In Dyrcona's gaze Earth appears as an object of cosmographic devotion:

> I clearly saw, as I had anticipated earlier during my voyage to the moon, that it was in fact the Earth turning around the Sun from the West to the East, and not the Sun around her, because I saw France followed by the boot-like shape of Italy, hereupon the Mediterranean Sea, then Greece, further the Bosporus, the Black Sea, India, China and finally Japan passing in front of the little peephole of my lodge, and a few hours after my descend, when the Southern Sea had turned beneath me, the continent of America took his place.[39]

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**37** | »Et moi, dis-je, je souhaites mêler mes enthousiasmes aux vôtres, je crois, sans m'amuser aux imaginations pointues dont vous chatouilles les temps pour faire marcher plus vite, que la lune est un monde comme celui-ci, à qui le nôtre sert de lune.« La compagnie me régala d'un grand éclat de rire. »Ainsi peut-être, leur dis-je, se moque-t-on maintenant dans la lune de quelques d'autre, qui souhaitent que ce gobe-ci est un monde.« (Cyrano 2006a, 6).

**38** | »[…] une grande plaque d'or«. (Cyrano 2006a, 31).

**39** | »Je connus très distinctement, comme autrefois j'avais soupçonné, en montant à la Lune, qu'en effet c'est la Terre qui tourne d'orient en occident à l'entour du Soleil, et non pas le Soleil autour d'elle; car je voyais, en suite de la France, le pied de la botte d'Italie, puis la mer Méditerranée, puis la Grèce, puis le Bosphore, le Pont-Euxin, la Perse, les Indes, la Chine, et enfin le Japon, passer

One of the peculiarities in the early modern relation between natural philosophy and literature is that they frequently exchanged their modes and tones of description. What reads like a matter-of-fact report in a narrative that is clearly marked as not being a disquisition on early modern astronomy, is paralleled and in a way complemented by poetic descriptions found in treatises of natural philosopher's like the previously mentioned Christiaan Huygens, who in 1655 discovered the first Moon of Saturn and rightly identified its nebula as rings.[40] Huygens' realm of observational, experimental, mechanical, and inventive activities expanded from the theory of probability to the measurement of time and from the perfectibility of lens' grinding to the question of extra-terrestrial life. His last treatise, the *Cosmotheoros*, appeared in 1698[41], three years after his death, and even by early modern standards, who are much more unstinting in regard to the intersection between science and literature, its two books are a hybrid disquisition that owes much to the poetic knowledge issued in early modern science-fiction. At times it prefers rhetorically enhanced narration over factual description, especially when it comes to astronomical questions such as the plurality of worlds.[42] Whereas Huygens in the first book outlined the former arguments for and against the existence of

successivement vis-à-vis du trou de ma loge ; et, quelques heures après mon élévation, toute la mer du Sud, ayant tourné, laissa mettre à sa place le continent de l'Amérique.« (Cyrano 2006b, 212f., my translation, HS).

**40** | First mentioned in his correspondence with his Paris colleagues Ismael Boulliau and Gilles Personne de Roberval, Huygens published his complete observations including the corresponding mathematical calculus in 1659. Cf. Huygens 1659.

**41** | Huygens 1698a. It was translated into English in 1698 and Dutch in 1699. Till mid-18th century, translations appeared in French (1702), German (1703), Russian (1717) and in Swedish (1774). The title of the English translation reads as follow: *Cosmotheoros. The celestial worlds discover'd: or, Conjectures concerning the inhabitants, plants and productions of the worlds in the planets.* Written in Latin by Christianus Huygens, and inscrib'd to his brother Constantine Huygens. London: printed for Timothy Childe at the white hart at the west-end of St. Paul's church-yard MDCXCVIII [1698] (Huygens 1698b).

**42** | In regard to the much debated topic of the »pluralité des mondes« cf. Guthke 1983; Bezzola Lambert 2002 and Campbell 2004 (on Godwin and Cyrano see 151-180).

extra-terrestrial species, the second book is devoted to the different cosmic orders that arise when the point of observation varies within the order of the then known planets. To the inhabitants of Venus, for instance, »the things in the sky« appear in an almost identical shape and position than they do for the Mercurians, except that they never can see Mercury in opposition to the sun and the sun being one and a half times larger in diameter compared to its appearance seen from Earth.[43]

The perception from outer space does not stop but includes the sight of Earth seen by a conjectural intelligent species living on the Moon. In fact, the sheer beauty of Earth's appearance in space is one of Huygens's strongest arguments in favour of extra-terrestrial life, especially on the Moon:

> What then, shall this Ball [the Moon; HS] be made for, nothing but to give us a little puny light in the Night-time, or to raise our Tides in the Sea? Shall not we plant some People there that may have the great pleasure of seeing our Earth turn upon itself, presenting them some times with a prospect of *Europe* and *Africa*, and then of *Asia* and *America*; sometimes half, and sometimes full?[44]

In the 17th century the »great pleasure« in observing the Earth slowly revolving in the vast space of an unlimited universe was clearly restricted to adventurous literary space travelers or fictitious inhabitants of the Moon and other planets. Three hundred years later it has become a second-hand visual experience for everybody by looking at photographs like *Blue Marble* or watching documentaries like *Unsere Erde aus dem All*[45] and *Das*

**43** | »In Veneris globo politis, eadem fere in caelo apparere necesse est quae Mercurio diximus, nisi quod hunc nunquam Soli oppositum […]. Sol vero illis major apparet quam nobis, diametro sescupla, orbe plus quam duplo […].« (Huygens 1698a, 50). The English translation reads as follows: »The Inhabitants of *Venus* have much the same face of things as those in *Mercury*, only they never see him in opposition to the Sun […]. The Sun appears to them by half larger in his Diameter, and above twice in his Circumference […].« (Huygens 1698b, 108f.).

**44** | Huygens 1698b, 108f. »Anne igitur credendum, tantae magnitudinis globum in hoc conditum esse ut noctu lucem tenuem largiatur, aut aestus maris cieat? Nemo erit qui pulcherrimo inde spectaculo fruatur Telluris nostrae in se revolutae, & nunc cum Europa Africam, nunc Asiam, nunc Americam ostentatis; nunc plene, nunc dimidio orbe lucentis?« (Huygens 1698a, 60f.).

**45** | National Geographic 2015.

*Universum*[46]. Comparing our cosmic images of Earth with the narrations, descriptions, and engravings outlined in this paper, it becomes evident that the 17th century was not only an era that institutionalized modern science and leveraged Copernican astronomy, it was also the time that provided us with ›Erdsichten‹ whose impressive visual semiotics and powerful aesthetics still echo in our contemporary visual notion of Earth in outer space.

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**46** | Discovery Channel 2015.

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