


# AT HOME UNDER THE DOME

ADAM KOZAK



Humankind has always longed to cross a certain boundary – wanting to somehow find a way to be inside images. Cutting-edge technology has brought such distant worlds closer, and so something which once seemed so far out of reach is now at our very fingertips

The New Horizons  
event at the Heavens  
of Copernicus Planetarium,  
Copernicus Science Centre,  
14 July 2015

## ACADEMIA IN THE LENS

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Fig. 1

Construction of the oldest geodesic planetarium dome in Jena, Germany, following designs by Walther Bauersfeld, ca. 1924



Fig. 2

Heavens of Copernicus Planetarium, Copernicus Science Centre, Warsaw

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works at the intersection of fine arts, cinema, and the new immersive arts. She is a director of animations and immersive films, an art director and visual artist, a lecturer and winner of numerous film awards and artistic grants. She has been involved with the Se-ma-for Film Studio, the Copernicus Science Centre in Warsaw, and Arts University Plymouth, and she currently works at the Film School and Museum of Contemporary Art in Łódź.  
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Since time immemorial, people have been admiring paintings and images depicted on the insides of domes of various kinds. It suffices to take a look at the panoramas of different cities – Istanbul, for example – to realize that building-topping domes have been around for centuries. Every time you stand beneath a dome, you lift your head, your body shifts orientation, and your perspective focuses on the hemisphere suspended above – be it adorned with illusionistic ceiling paintings, or with the starry night of a planetarium. Literally and figuratively, without realizing exactly when or how, we immerse ourselves in the suspended vision and become one of its elements.

In Italy or in Muslim countries, domes are mainly found in religious buildings, but this varies in other parts of the world. Many of us have also found ourselves immersed while gazing up inside sports stadiums, science centers, or various spherically-shaped buildings... Visiting the Pantheon in Rome always stirs powerful emotions. Measuring 43.3 meters in diameter and topped with a coffered concrete dome, with a central *oculus* (Latin for “eye”), it has been the world’s largest since 125 A.D. Such places make us truly understand what it is like to be inside a sphere.

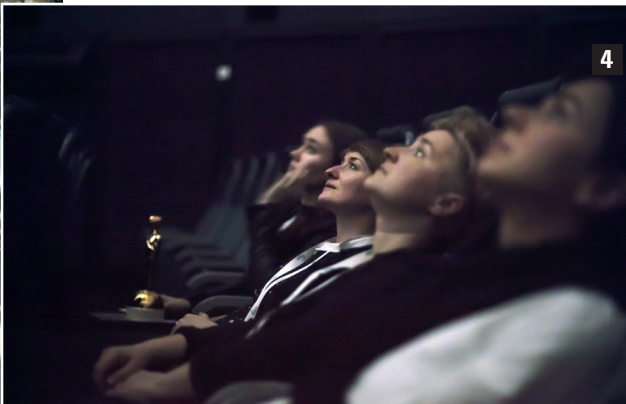
Planetarium domes provide a similar experience, albeit on a different scale. At the heart of every plan-



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etarium is a projector depicting millions of stars, such as can only be seen from the darkest corners of the globe. Planetariums are also increasingly offering screenings of immersive popular-science films, and state-of-the-art digital technology allows us to watch moving images of the starry skies. Planetariums have become venues for concerts, live displays, poetry readings, dance spectacles, and myriad other events.

Planetarium technology has made a great leap forward with the emergence of Fulldome – immersive video covering an entire dome-shaped screen. The roots of the technology lie in a range of panoramic systems featuring multiple projectors, in military flight simulators, in immersive and cinematic art, and in dome architecture itself. Fulldome films, frequently animations, are projected onto a hemispherical screen. New digital planetariums are being built all over the globe to make use of the technology; they vary in size from large domes of tens of meters in diameter to

Fig. 3  
Screening of the film  
“Dream to Fly,”  
Astra Film Festival, Sibiu,  
Romania, 2016

Fig. 4  
Audience reclining under  
the planetarium dome at  
the Fulldome Film Festival,  
Jena, Germany, 2017

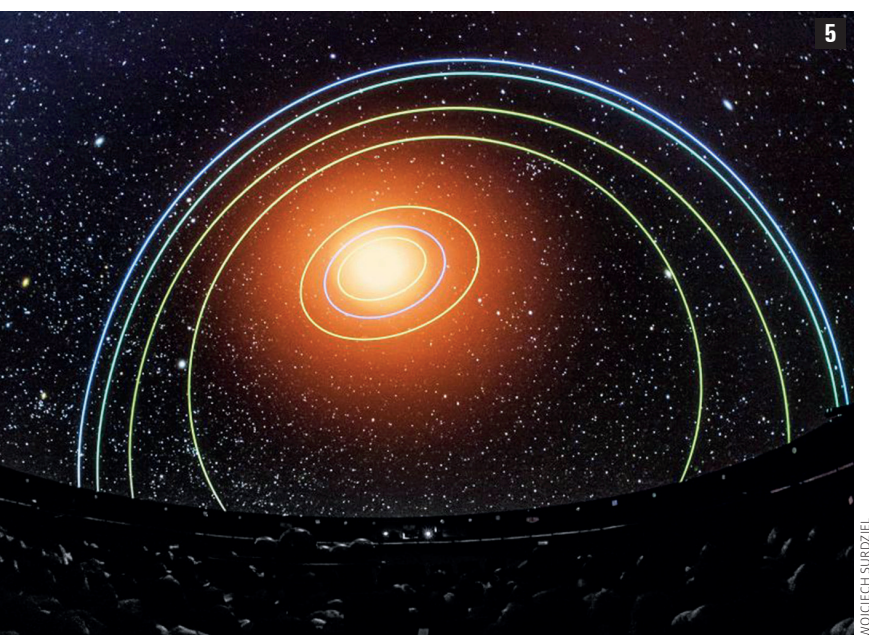


Fig. 5  
Heavens of Copernicus  
Planetarium, Copernicus  
Science Centre, Warsaw,  
14 February 2017, Warsaw

small, inflatable portable venues. Fulldome is swiftly becoming an important educational medium and source of entertainment for people of all ages and backgrounds.

## Immersive technology

In today's world, the way we respond to visual experiences is determined not just by our eyesight but also by our entire bodies. As a species, we have honed our mechanisms of seeing and perceiving reality to be close to perfection. However, the concept of perception takes on a special meaning in the context of planetariums and immersive cinema.

Perception is one of the most important elements responsible for how we experience and interpret physical and mental stimuli. Without it we would not be able to make sense of what we see and interact with. We learn perception throughout our entire lives; it is an element of our evolution and a personal lesson for each and every one of us.

Under a dome, our field of vision – the screen – curves in every direction, expanding and stretching out to surround and seemingly wrap itself around us from all sides. Viewers observe moving images in front, above, beside, and behind them. They are so immersed as to almost become a part of them.

Today's planetariums are about more than just their curved domes – they are places where we become participants of events, by being wholly surrounded by images. Under the dome we become more sensitive, helpless, vulnerable. Here, on the boundaries of the real world, enclosed in this dark capsule, we become pilots of a vast ship taking us to different worlds. Would such a journey be possible in a traditional cinema?

Perhaps, but the experience would not be anywhere near as full.

## Planetariums

Technology has always been a factor driving the development of all scientific fields. This of course applies to planetariums, although with a slightly different dimension. Here the audience is purposefully enclosed in a darkened room, where they sit on reclining seats or lie on the floor to admire the starry sky in its full glory. The planetarium space is designed so that the visual and auditory aspects come together to form a perfect whole. The carefully placed speakers emit sound that surrounds the audience, while the projectors show frame sequences sliced to make them come together into a smooth whole when projected onto the dome. Although the medium is technologically demanding, the planetarium atmosphere, with the sense of originality and experience it provides, more than make up for it.

We are living in an era of growing interdisciplinarity, meaning that it is simply not enough to be an expert in a single specialization in this fast-changing reality. In recent years, planetariums have become yet another medium whose function is no longer limited to what was once its main role (popularizing astronomy). Instead, they are increasingly employing teams drawing together experts in a range of fields across science and the arts, exploring the spherical nature of the space around them and giving it different meanings. Such collaboration takes on a fresh dimension to produce a unique, creative, interdisciplinary environment. This kind of initiative was behind the production of Poland's first Fulldome film "Dream To Fly" (2013), which has enjoyed great popularity the world over and has remained a permanent fixture in the repertoire of the Planetarium of the Copernicus Science Centre in Warsaw for almost a decade. There are now more and more immersive films being produced worldwide, and more and more production studios whose work includes planetarium screenings – such as Poland's outstanding Creative Planet studio ([www.creativeplanet.pl](http://www.creativeplanet.pl)).

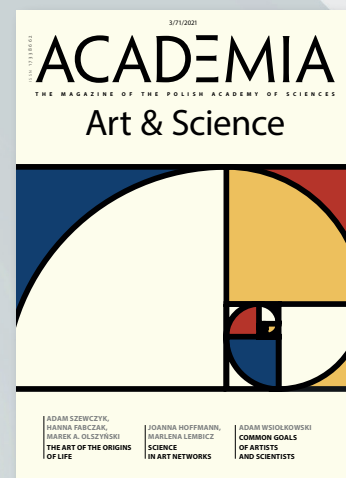
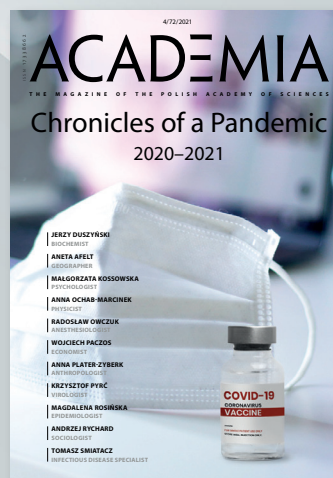
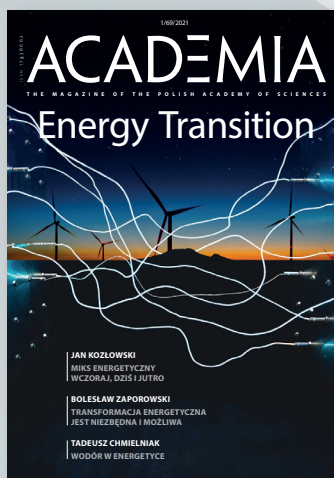
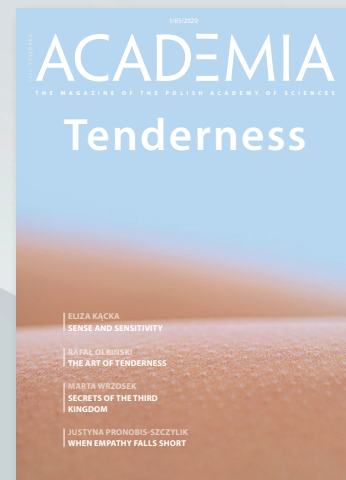
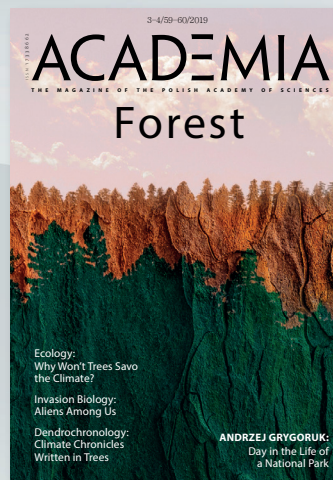
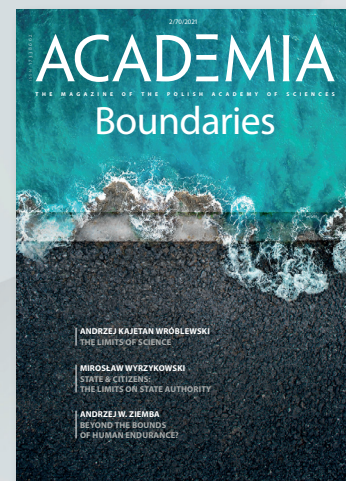
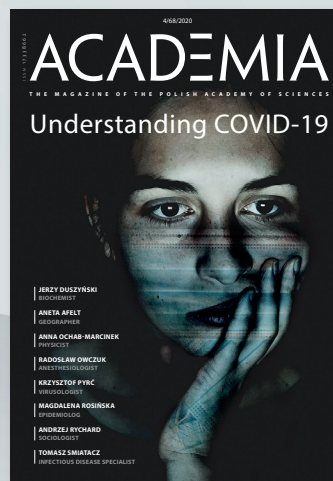
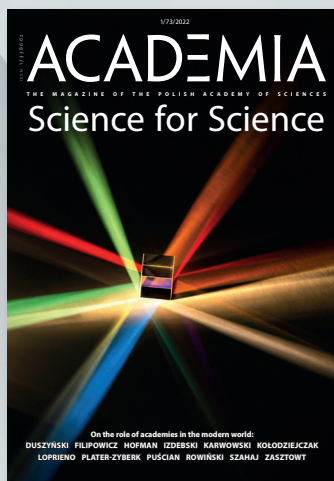
Even after many centuries, we are still discovering and exploring the extraordinary possibilities of what can be experienced under a dome, pushing the boundaries of space and perception. Perhaps the scale, budgets, and reach of Fulldome productions are more modest than those for cinemas with standard screens, but the educational value, perceptive impact, and raw power of audiovisual effects could far outweigh them.

The article features excerpts from Paulina Majda's PhD thesis entitled *My Creative Path: From Assemblage to Domes – An Exploration of New Ways of Perceiving Cinema and Its Technical and Artistic Conditions Based on the Immersive Film "Hello, Earth"*, Warsaw, 2018.

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