

Bariónica: Combining Photography, Philosophy and Astronomy for the ESA/Hubble *Ode to Hubble* Competition

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In early 2015 the artist behind the photographic collection *Bariónica* entered it in video form into the European Space Agency's (ESA) *Ode to Hubble* competition — a public video competition organised to celebrate the 25th anniversary of the Hubble Space Telescope¹. The photographic collection aims to show the connection between cosmic matter and the matter which constitutes mankind, using images and ideas from astronomy to symbolise the connection between what we are, and where we came from. On 24 April 2015, Hubble's 25th birthday, *Bariónica* was announced as one of two winning videos of the contest. In this article its creator, Desiré de Palacio, tells us about the fundamental ideas that led her to create her piece, and about the experience of being one of the contest winners.

Science in vogue

The philosophy of science is something that has fascinated me for some years, but my interest in astronomy topics began in the wake of discovering the documentary that I consider to be the flagship of science communication: Carl Sagan's *Cosmos*. Sometime later, with the new version presented by Neil deGrasse Tyson, I once again found myself in awe of both the grandeur of its contents and its capacity to express complex knowledge in such a direct and simple way.

My way of working as a photographer always goes hand in hand with the philosophical ideas that I am investigating at the time. The series *Cosmos* planted a new seed: the idea of creating a photographic composition which blended mankind with astronomy. Shortly afterwards, I discovered the Hubble images and this idea began to germinate

In my academic training I have tried to combine philosophy with knowledge about audiovisual technology. Presenting complex ideas in this way is very effective for reaching a broader public audience. Using audiovisual content as a creative tool for outreach and education is becoming ever more popular, especially in science. Through this means, an open and communicative relationship can be fostered between the public and those behind the science, which can enrich the lives of a great many people.



Figure 1. Photograph from the *Bariónica* collection and its inspiration; a Hubble Space Telescope image of the planetary nebula NGC 5189. Credit: Desiré de Palacio and NASA, ESA and the Hubble Heritage team (STScI/AURA)

Documentaries are not the only means through which video popularises science: entertainment plays its part too. In the past few years, the situation comedy, *The Big Bang Theory*, in which the main characters express their passion for science, has become a television phenomenon. If, to all this, we add the use of social media networks for science outreach, we end up with a new horizon for science communication. Something is changing, and is being achieved with the help and input of many people across the globe: science is in vogue.

This new interest in science will no doubt have highly positive consequences, which we will be able to analyse in the coming years. Nevertheless, we cannot lower our guard, as we are just beginning to take this path and still have a lot of work to do.

What do people think about the Universe?

Whilst surfing social networks I came across a video that ended up going viral².

This video illustrated a simple idea; that the Solar System is in movement. It showed both the movement of the planets around the Sun and also the movement of the Solar System as a whole with respect to the centre of our galaxy.

What really drew me to look further at the video was my own curiosity. What had made this video go viral? Whilst rummaging through the comments and links, it became clear that it was not because of the quality of the animation, but instead, that the users had been fascinated to discover that the Solar System moved within our galaxy, and in turn our galaxy moves through space.

What does this tell us? We can interpret it in several ways. One inescapable interpretation is the implication that our compulsory education system has shortcomings. This awe of something very simple, and central to our existence, implies that our education system does not cover basic knowledge about the Universe sufficiently well.

Another way of seeing this could be to recognise the need to support the ideas which help pupils to learn about the Universe by connecting them with their own experiences. So here, for example, the public are connected with astronomy by discussing our place within the Universe — in other words, to explore the philosophy behind the science.

The place of philosophy in science and culture

Exploring philosophy as part of science is not only about increasing our level of scientific culture, but also about creating concepts that can be useful to us in our day-to-day lives when trying to understand our own existence. Our culture is based on permanence and not reaching it creates serious internal conflicts, in addition to dissatisfaction with the lack of change in our lives. Integrating ideas such as movement, chance, creation, transformation or change can help to mitigate the fear of the future that appears to be innate in us. What better example to assume change

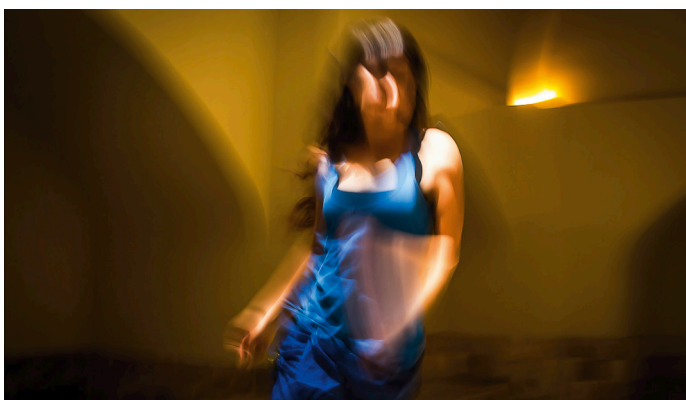
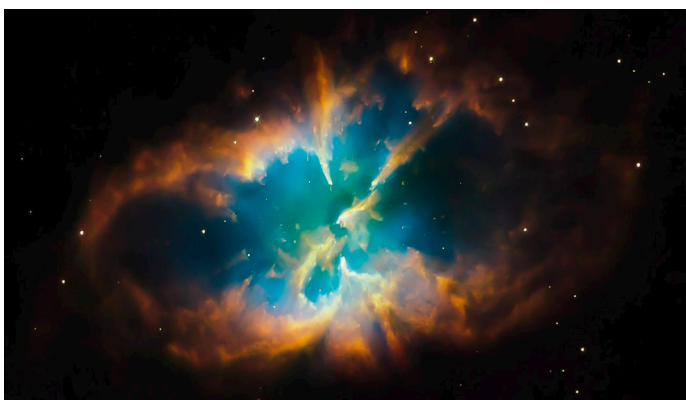


Figure 2. Photograph from the Bariónica collection and its inspiration; a Hubble Space Telescope image of the planetary nebula NGC 2818. Credit: Desiré de Palacio and NASA, ESA and the Hubble Heritage team (STScI/AURA)

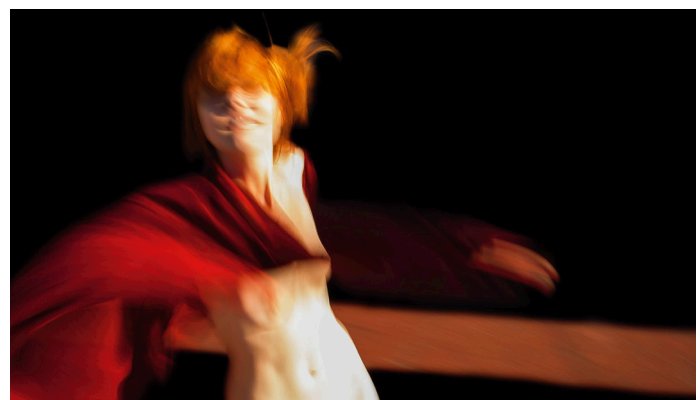


Figure 3. Photograph from the Bariónica collection and its inspiration; a Hubble Space Telescope image of the planetary nebula NGC 2346. Credit: Desiré de Palacio and NASA, ESA and the Hubble Heritage team (STScI/AURA)



Figure 4. Photograph from the Bariónica collection and its inspiration; a Hubble Space Telescope image of the star cluster Westerlund 2. Credit: Desiré de Palacio and NASA, ESA and the Hubble Heritage team (STScI/AURA), A. Nota (ESA/STScI), and the Westerlund 2 Science Team

as something necessary in our lives than the data we possess about the creation of the Universe and how the matter within it develops and evolves.

It was my aim to revitalise the fundamental philosophical issues and concepts explored in Pre-Socratic philosophy³, and update them using modern, scientific explanations. Playing with this idea in my mind I decided to undertake an investigation which is, currently, still in development. It is based on two main questions: What do people think about the Universe? And how can the knowledge of the cosmos affect our perception of life?

The study is focused on Spanish society, with a wide-ranging group taken from the general public, with different profiles based on age and academic training. It is about drawing conclusions both from the general level of knowledge, and also from the repercussions that this has had on people.

Although the study is not yet complete, we can catch a glimpse of some interesting data. A barrier seems to exist when conceiving the Universe as part of the actual history of the human being. There is a kind of intrinsic fear of reflecting on what exists beyond our atmosphere.

Leaping into the unknown is always a challenge.

The oldest and strongest emotion of mankind is fear, and the oldest and strongest kind of fear is fear of the unknown.

H. P. Lovecraft

The history of philosophy shows that many existential questions have arisen, and continue to arise, ever since people began to reflect on their wider origins: What is mankind? Why are we what we are? Where do we come from? Whither are we heading? What is our place in the Universe?

Science has gone a long way towards answering some of these questions, but although it plays an important role in helping us to understand ourselves and our history it does not reach everyone. Barriers to this enriching information include the complexity of the ideas, the need for some previous knowledge, or the debates between different theories, which for those who are taught that science is a case of right and wrong, can add even further to the confusion. As human beings, we yearn for answers, and without them we turn to unscientific criteria, or even pseudo-sciences, as a haven. This creates a further reason for engaging everyone with science.

With the photographic series, *Bariónica*, my intention is to use light to pass through the barriers to reaching scientific knowledge and to make this knowledge into something visual with which we can all identify. This would not have been possible without having delved into the discoveries and images from the Hubble Space Telescope.

Hubble's magnetism and the power of scientific diffusion

The images from Hubble were already present in our textbooks and museums before the internet boom, and nowadays, they are everywhere. At the beginning, for those of us not involved, it was unclear whether these images were just drawings or if the stars were actually as they appeared when captured by the images.

When someone observes images from the Hubble Space Telescope, they are not left indifferent. On social networks we can find profiles of many different characters and



Figure 5. Photograph from the *Bariónica* collection and its inspiration; a Hubble Space Telescope image of the Horsehead Nebula. Credit: *Desiré de Palacio* and NASA, ESA and the Hubble Heritage team (STScI/AURA)



Figure 6. Photograph from the Bariónica collection and its inspiration; a Hubble Space Telescope image of the pair of colliding galaxies known as NGC 2207 and IC 2163. Credit: Desiré de Palacio and NASA, ESA and the Hubble Heritage team (STScI/AURA)

people among the telescope's followers. These images produce an aesthetic experience that rapidly hooks the spectator.

Transcending the visuals, the telescope's magnetic appeal is also due to the enigma that we sense behind each image. There are those who are content with the aesthetic experience, but for those who want to delve deeper into the phenomenon behind the images, the task has become ever easier thanks to the informative work of pages such as the ESA/Hubble website and its partners⁴. For me the reward of delving into these images further was extensive and my decision was made: The photographic essay that would link my current concerns would have Hubble discoveries at its heart.

Bariónica

Art can be conceived as an ability to create significant connections with our thoughts. Achieving a good synthesis, one which possesses strength and concordance with the idea you want to express, is not an easy task. For me it was a huge challenge.

There were two fundamental ideas that I wanted to display to the public in the *Bariónica* collection. The first, was to highlight that mankind is not distinct from other matter that exists throughout the Universe, but is part of something intrinsic. I decided to use the physics concept of baryonic — or physical — matter to create a simple link between the matter shown by Hubble's images and that which constitutes our own

bodies. My intention was to integrate the Universe within the history of mankind.

The second idea behind the collection was to express and draw attention to the constant changes that matter experiences.

Photography has its limitations when it comes to expressing points, especially when dealing with movement, and Hubble's own images create a paradox: How can we perceive, for example, the full power of a supernova as a static image?

The weight of constant change, in this case, falls to the background and because of this, assuming the challenge of representing it through photography became interesting. This helped me to determine

which photographic technique I was to use for the portrait of the human being, a portrait in motion.

For one half of the collection I used portraits in motion which I had previously created. Limiting myself to finding similarities, I searched through Hubble's pictures for the ones which were most alike. For the second half of the piece I selected a group of images taken by Hubble and had models imitate the shapes of the nebulae to create the analogy.

After a lot of work I started to feel satisfied with the results, so that around the middle of March 2015, I had a collection from which I intended to create an exposition. During the process I could not help but ask myself what the thoughts of the actual Hubble team would be if they ever saw my work. It was only a dream; I never thought that it would actually happen. The stars aligned in my favour though.

Ode to Hubble

During the creation of *Bariónica* I visited Hubble's webpage almost every day, searching for information regarding its images. Shortly after finishing my photographic collection I discovered the contest, *Ode to Hubble*, organised by ESA as part of ESA's and NASA's programme of activities to celebrate 25 years of Hubble. They asked the public to answer, in an artistic

manner, the question: How has Hubble inspired you? That was the exact question I had been waiting to be asked: I had my answer!

To take part in the contest I created a video piece featuring and building upon my photography work that explored the questions I had set out to address. Taking part in the contest was a fun experience, and the initiative was a dynamic and active way to involve the public with astronomy. To watch the interpretations that each contestant presented concerning the Universe and Hubble, in addition to the audiovisual manner in which the ideas were developed, fascinated me.

As the contest carried on, being one of the six finalists was already achievement enough, and I was delighted by the thought that the judging panel, composed of members of the Hubble team, would see my video.

I never thought that I would win the contest, and when this happened I felt truly lucky. Thanks to this, the *Bariónica* collection has been revitalised, with many new followers. This has given me the strength to continue joining science and art in my work. Due to this, I will always be grateful for the opportunity that the Hubble Space Telescope and its team have given me.

I have closed a highly positive feedback circle in which science outreach has awoken

new concerns in me, allowing me to access areas where my academic training had not previously taken me. With my artistic creation I have tried to contribute by adding my piece to the diffusion of astronomy ideas and I was able to do this to better effect, and reach far more people, through an innovative science outreach initiative.

Notes

- ¹ Find out more about the *Ode to Hubble* video competition and watch *Bariónica* and the other shortlisted and winning videos: <http://www.spacetelescope.org/projects/Hubble25/odetohubble/>
- ² Watch the viral video of the Solar System in motion: <https://www.youtube.com/watch?v=mvgaxQGPg7I>
- ³ More on Pre-Socratic philosophy: https://en.wikipedia.org/wiki/Pre-Socratic_philosophy
- ⁴ There are two websites dedicated to news, information and science from Hubble. One is run by ESA (<http://www.spacetelescope.org/>) and the other by NASA and the Space Telescope Science Institute (<http://hubble-site.org>).

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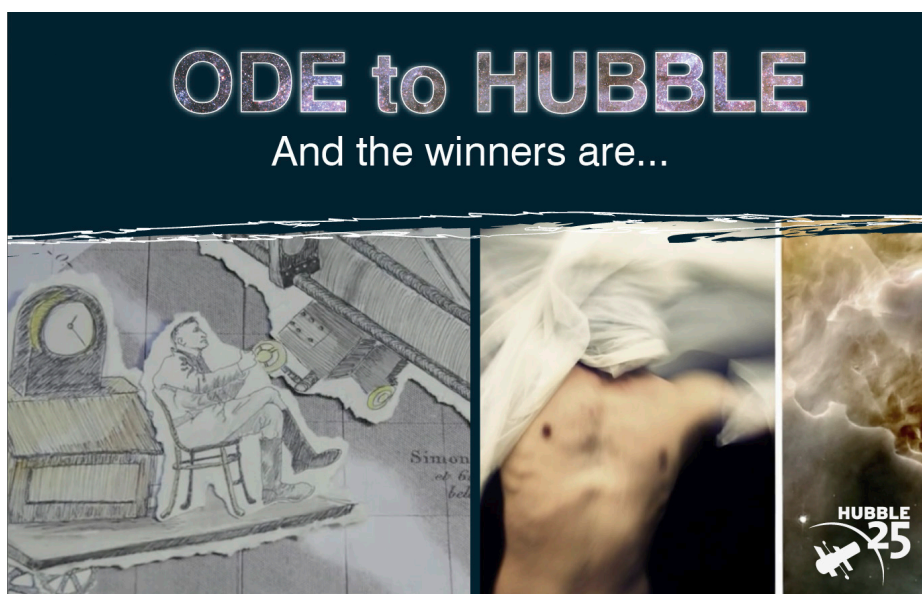


Figure 7. Promotional banner from the ESA/Hubble *Ode to Hubble* competition. Credit: ESA/Hubble

Biography

Desiré de Palacio is a philosopher and photographer interested in science. Through her photography she expresses the ideas investigated in philosophy. One of her aims is to create tools and audiovisual material to reach school students and allow them to more easily understand some complex issues in science and philosophy education.