

When Astrochemistry is a Journey.

Natalia Ruiz Zelmanovitch¹, and Marcelo Castellanos¹

¹ Grupo de Astrofísica Molecular, Departamento de procesos atómicos, moleculares y en superficies del Instituto de Física Fundamental (IFF), Consejo Superior de Investigaciones Científicas (CSIC), c/Serrano, 123, 28006, Madrid (Spain)
natalia.r.zelmanovitch@iff.csic.es; marcelo.castellanos@iff.csic.es

Abstract

The project “NANOCOSMOS, Gas and dust from the Stars to the Laboratory: Exploring the Nanocosmos”, funded by the European Research Council (ERC) with a Synergy Grant, obtained, in the call for 2016, funds of the Spanish Foundation for Science and technology (FECYT) in order to produce a documentary about the project, entitled “Nanocosmos: a journey to the small”. In this presentation we will talk about the experience that resulted in this audio-visual project.

1 Introduction

“Gas and dust, from the Stars to the Laboratory: Exploring the Nanocosmos” is the name of a project funded by the European Research Council (ERC) through a Synergy Grant with 15 million Euros. The group comprises three teams (two in Spain and one in France)¹. The main goal of the project is to go in-depth on the understanding of how dust grains form in the envelopes of evolved sun-like stars. In order to do so, and besides observations, models and other developments, this Astrochemistry project has successfully developed an experimental set-up, called the Stardust machine, in the ICMC-CSIC (Madrid, Spain) whose goal is to reproduce those processes in an ultra-high vacuum environment. The importance of publishing scientific results based on NANOCOSMOS in the scientific literature goes without saying, but it is also important and a stated NANOCOSMOS objective to disseminate the achievements of the team and its scientific and technological results to a wider audience. In this presentation we will discuss the tools we are using to spread them to the society, from the

¹In Spain, the main groups are at the Instituto de Ciencia de Materiales de Madrid (CSIC) and Instituto de Física Fundamental (CSIC), and in France at the Institut de Recherche en Astrophysique et Planetologie (IRAP).

traditional webpages to an ERC-Comic, going deep in the elaboration of the documentary “NANOCOSMOS: Un viaje a lo pequeño.”

2 Outreach in NANOCOSMOS

NANOCOSMOS has a “Communication team”, composed by the Manager and the Public Information Officer (PIO). They are the contact points for the NANOCOSMOS community to spread all the information created by the project teams. Once the scientist/engineer has a result (accepted paper) or considers any advance interesting to a wider audience, the team, through the Principal Investigator (PI), should bring this to the “Communication team” attention that will be in charge of developing the information.

NANOCOSMOS has a web page to publish and disseminate news and releases based on scientific results. This is a key tool to raise the image of the project and improve dissemination to specialists, potential users of the technologies being developed, politicians and public funding authorities, as well as the general public. Also social media accounts facebook and twitter are very useful to spread all the news and information generated in the website.

The process begins with the accepted paper: from that scientific result we can obtain several products as press releases (for the mass media), outreach articles (to be published in the NANOCOSMOS website or in the Naukas web page, the main site for science outreach in Spanish), notes for the blog, social media posts (twitter and/or facebook), interviews (written or in video for the youtube NANOCOSMOS channel), videos and animations explaining those results, visits to the different machines where the experiments take place, talks, etc. We have also collaborated in radio programs talking about science.



Figure 1: Promotion of the “NANOCOSMOS: Un viaje a lo pequeño” road movie. Credit: LuzLux.

3 “NANOCOSMOS: Un viaje a lo pequeño”, the documentary

“NANOCOSMOS: Un viaje a lo pequeño” is a 40-minute road movie about laboratory astrophysics supported by FECYT, the Spanish Foundation for Science and Technology from the Spanish Ministry for Economy, Industry and Competitiveness and CSIC, the Spanish Council for Scientific Research, through the European Research Council (ERC). This documentary is a journey to the origins of dust grains through Laboratory Astrophysics.

The story unfolds in three levels: the journey of the recording team from Madrid (Spain) to Toulouse (France), the laboratory experiments explained by its principal investigators and the journey of the cosmic dust grains since they are born in the envelope of an evolved star until they become part of something bigger (a star, a planet or, why not, a living being). This work wants to transmit the expectations of the teams struggling to understand this process, the technological and human challenge involved in building complex machines with a goal: to reproduce in a laboratory what happens in space.

The documentary will circulate along circuits of scientific movies and specific science channels for a year, and after that it will be available on the NANOCOSMOS website. The movie is available in Spanish with subtitles in English and French.

4 How to make a science documentary funded by FECYT

In 2016 the outreach team of Nanocosmos ERC, in CSIC, participated in an open call for funds made by the Spanish Foundation for Science and technology (FECYT) in order to produce a documentary about the project, entitled “Nanocosmos: a journey to the small”. Writing such a proposal is, in itself, a hard and demanding work, as the templates are full of details that must be fulfilled.

The answer (positive) came in January 2017, but it was a provisional answer, so in order to initiate the process of making an open call for allocating a public contract, we had to wait for the definitive acceptance, given in May 2017. We were granted with 30,000 € (we asked for 33,000 €) for a project valued in 64.000 €. In the Spanish Public Administration, when the cost of a work is higher than 18,000 € it is compelling to do a public open contract process. As the institution awarded with the FECYT money (a public institution) was the ICMM-CSIC (also public), the contract had to be elaborated in the Public Procurement Department of CSIC. So, together with them, we began the redaction and elaboration of the documents needed to open a call for the enterprises specialized in science outreach documentaries. There was no precedent in the CSIC institution, so we had to begin from scratch. Once elaborated and approved by the Public Procurement Department of CSIC, we initiated the open process that usually requires three months to be completed.

In our case, August was just in the middle of that period of time, so we had to wait one more month to know which enterprise was selected. Finally, from the four enterprises that participated in the open call, the selected one was LuzLux S.L. It was announced in middle September. The team had barely six months to familiarize with the issue (laboratory

astrophysics and astrochemistry), document, write, record, edit and promote a 40-minute documentary... We were already running out of time -as FECYT gives extension of deadlines if you do it in time, we asked for it, so our deadline was extended for three months (officially, from December 2017 to March 2018).

The initial agenda had to change, as we had to record travelling from Madrid to Toulouse and we could not risk the winter time to avoid us to do the recordings outdoors. The recordings and interviews were made during several weeks in November, December and January. The final script was finished at the end of January. The spot was ready the 20th of March 2018. The director, Fernando Rey, the promoter and Principal Investigator of the documentary FECYT project, Natalia Ruiz Zelmanovitch, the Scientific Adviser and Principal Investigator of NANOCOSMOS ERC, José Cernicharo, and the rest of the team ², presented the documentary, together with Ana M. Correas, Coordinator of the Museo Nacional de Ciencia y Tecnología (MUNCYT) at the Coruña Headquarters. It was the 13th of April of 2018, as FECYT allows one more month to do administrative activities (mainly, paying bills).

Once presented, the documentary is participating in circuits of scientific movies and specific science channels (until March 2019), and after that it will be available on the NANOCOSMOS website. The movie is available in 4 HD and 4k, and has four different versions: Spanish without subtitles, Spanish with subtitles in Spanish, Spanish with subtitles in English and Spanish with subtitles in French.

5 Last steps: justification, promotion and distribution

The period established for the justification process was one month (April 2018). In our case, we had just three bills to present, as everything was included in two packs: LuzLux (producer of the whole movie) and Scixel (3D design). FECYT also requested the whole contracting dossier (400 pages) and other documents. The final answer accepting all the documents required arrived the 2nd of July 2018.

Concerning the promotion and distribution, as the money granted by FECYT has to be spent in the period established by the deadlines (in our case, all the bills had to be paid before the 30th of April), we couldn't hire a distribution company to take care of those tasks. We are now using online platforms to promote and distribute the movie, also participating in contests as the Premios Prismas de la Casa de las Ciencias a la Divulgación and the Biental Internacional de Cine Científico and offering it to schools, associations, science platforms and all kind of people previously interested in science.

²Original idea: Natalia Ruiz Zelmanovitch; Realization: LUZLUX S.L.; Direction: Fernando Rey Daluz; Scientific Advisor: José Cernicharo Quintanilla; Script: Luis Rodríguez Cao, Natalia Ruiz Zelmanovitch, Sara Fernández; Production: Gonzalo Corral, Patricia Fernández, QUADRADO VERDE, Natalia Ruiz Zelmanovitch, Miguel Rey; Recordings: Santiago Blanco, Fernando Rey Daluz; Sound: Santiago Blanco, Gonzalo Corral; Postproduction: LUZLUX S.L.; 3D Design: Enrique Sahagún, SCIXEL; Voiceover: Ana Lemos.



Figure 2: Poster of the “NANOCOSMOS: Un viaje a lo pequeño” road movie premiere, and institutions participating in the documentary. Credit: LuzLux.

6 Summary

Increasing resources invested to create knowledge and improving the mechanisms used to transfer such knowledge so that it benefits society as a whole must be top priorities of all governments. This is why our project pulls for science and science outreach as some of the best ways to make a better society.

In short, we have a documentary talking about laboratory astrophysics that defends basic science, team work, the relevance of instrumentation in astrochemistry, the science internationalization, and the gender focus, telling a story as a road movie, in an adventure seeking for knowledge.

Our motto is:



Figure 3: “#NoScience, no future” motto campaign.

Acknowledgments

NANOCOSMOS ERC has received funding from the European Research Council (ERC) under the European Union's Seventh Framework Programme (FP7/2007-2013) / ERC-2013-SyG Grant Agreement no. 610256.

“NANOCOSMOS: Un viaje a lo pequeño” is funded by the Fundación Española para la Ciencia y la Tecnología (FECYT) from the Ministerio de Ciencia, Innovación y Universidades (Spain) through the Project FCT-2016-10779.

People in the movie “NANOCOSMOS: Un viaje a lo pequeño”: GEM: José Luis Alonso, Santiago Mata, Lucie Kolesniková, Elena Rita Alonso, Iker León. CRESU: Elena Jiménez, Bernabé Ballesteros, Antonio José Ocaña Fernández, Sergio Blázquez González. TOULOUSE: Christine Joblin, Richard Clergereaux, Hassan Sabbah, Anthony Bonnamy, Karine Demyk, Shubhadip Chakraborty, Rémi Bérard, Ming-Chao Ji, Olivier Berné, Kremena Makasheva, Mathias Rojo, Simon Dap, Xavier Glad, Pavel Yuryev. MADRID ICMM (CSIC): José Ángel Martín Gago, Lidia Martínez, Gonzalo Santoro, Pablo Merino, M^a Francisca López, Koen Lauwaet, Javier Méndez, Carlos Sánchez. MADRID IFF (CSIC): José Cernicharo, Nuria Marcelino, Marcelino Agúndez, Javier Rodríguez Goicoechea, Sara Cuadrado, Marcelo Castellanos, Juan Ramón Pardo, José Pablo Fonfría, Luis Velilla, Emeric Bron, Sarah Massalkhi, Guillermo Quintana, Elena Moreno, Jason Champion, Octavio Roncero. MADRID IEM (CSIC): Isabel Tanarro, Victor José Herrero, Ramón Javier Peláez. YEBES: Juan Daniel Gallego, Belén Tercero, Miguel Santander, Javier Alcolea, Ricardo Ignacio Amils, Rafael Bachiller, Valentín Bujarrabal, Francisco Colomer, Pablo de Vicente Abad, M^a Carmen Díaz, Asunción Fuente, Miguel Gómez, Isaac López Fernández, Antonio José Ocaña Fernández.