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X_Science: Communicating Science through Cinema and Science Fiction

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Abstract

Science and scientists are often considered too far from common people and too hard to be understood. Nothing is more wrong than this statement but it is true that sometimes there is a gap between the work of the scientists and people. A gap working on both ways even if the scientist is doing research on subjects matching present and future needs of the population and the community is using the practical application of discoveries. Since the end of the 1980's there is a growing number of events trying to fill this gap and the last decade has seen a real effort from the European Community to support events that might be fruitful to make all actors aware of the close link between the scientific and non-scientific communities.

"X_Science: Cinema between Science and Science Fiction" is one of these activities organized by the Faculty of Mathematical, Physical and Natural Sciences of the University of Genoa, together with the GenovaFilmFestival and funded by the Liguria Region Governance. The formula is easy: Cinema can act as a catalyst to improve the discussions and therefore the exchange between common people and scientists on topics concerning technology, discoveries, issues, hopes and fears. During X_Science discussions are inspired by SciFi movies from the origins to the most recent productions, with members of the scientific community discussing together with the audience and letting the debate flow in a natural way, like a river where all contributions are synergistically leading to the ocean of awareness. Short movies worldwide produced during the last three years compete for the X_Science Award and allow us to get a glance on the most recent and fresh perceptions of our present and close to far future.

Science Fiction like every work of art is the mirror of the present where the artist is distilling the common sense of things: what is considered real, what is felt as good and what as bad or even evil, what are the expectations (in our case from science and technology), and what are the fears (e.g. the end of humankind by its own activities).

After 6 editions of this festival, numerous guests and cooperation (e.g. with EuroScience, European Science Foundation) and thousands of people participating and making this event alive we can evaluate the constructive and encouraging aspects and those that should be improved.

X_Science: cinema between science and science fiction is an event arising from the "Orienting panel" of the Faculty of Mathematical, Physical and Natural Sciences of the University of Genoa, organized by GenovaFilmFestival and proposed since 2006 with the financial support of Regione Liguria, as main sponsor.

The sparkle that started this adventure involving academics, movie experts and the largest audience one might imagine came from a couple of years of experimental events like "Vedere la Scienza" (watching the science) where documentaries were proposed to the public at the presence of "experts" to discuss with the



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audience. The second step was to switch from Scientific Documentaries to Science Fiction movies with all the risks and criticisms from a part of the local scientific community.

The main question was and still is: “are we making science fiction or science? So what's the message we're passing by offering sci-fi movies?”

To the authors of this paper and creators of X_Science the answer could be pretty fast and easy: “what would be now science without the visionary imagination of our ancestors?”; however we wanted to better articulate the discussion with another question: “are you talking more about science with your pals not necessarily belonging to the scientific community after a documentary or after a B Sci-Fi movie full of funny or dramatic errors?”.

If that was the beginning we can be honest saying that the purpose of the organisers was much higher and noble than a simple sophistic discussion like the previous one: to shorten the gap between scientists and people showing that we've to listen each other and to feel as part of a unique community if we want to improve or, quoting Nicola Tesla “increase the human energy”.

The previous short dialogue is by the way worth to be shortly observed. Working in our laboratories, the eyes on the infinitely far, small, big we often loose contact with reality. I've seen scientists skilled with electron microscopes begging help for the usage of a copying machine or a cell phone. The impression of a closed community is to be “different” to not say “better” because we study “why” to know “how and when”. The question is: “are we Merlin the wizard?” of course no! But if we observe the reaction of the rest of the community we realize that we've to face the typical consequences of an offensive-defensive system. “Scientists are crazy. They don't know what we need. They scare me. They know all. They will save us.”

It has been easy to find this criticism in a lot of movies where the stereotype of the scientist is depicted and where you might meet the good and evil one and usually the latter is much more charming and smart than the previous one.

But the question “are we making science fiction?”, qualifying with a negative meaning this branch of culture existing since ever but only defined at the beginning of the XXth century as a specific literary and cinematographic gender, shows up how a part of scientists are scared to appear alchemists instead of chemists, forgetting that the Arabian original meaning of Al-Chemy is The Chemistry, or better to say the Science.

Therefore we tried; we found financial support (Regione Liguria, University of Genoa, Festival of Science of Genoa, private companies) and partners among the highest European institutions starting from European Science Foundation, COST, and Euroscience. But what we found that justified the all adventure until now was a great contribution from movie makers and the participation of an audience that increased year after year.

The formula is easy. The core is an international short movie contest with three awarding levels: X_Science (attributed by an international jury), X_Audience (decided by the people attending by filling an official voting form), X_Faculty (proposed by a panel of academics and students representing all grades of the University of Genoa). The latter has been improved at the European level by the introduction of a member of Euroscience that decided to support this award.

X_Scientist: a member of the international scientific community devoted to one of the many topics of research, who is part of the X_Science award jury and has dedicated a special session where he/she has a lecture concerning his/her activity followed by a movie introduced and then discussed with the audience.



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X_Feature: movies selected among the worldwide production of documentaries, documentaries, mocufiction and science fiction movies with one goal, to find the best balance between quality and questions. With quality we consider the product, the entertainment, the pleasure to sit in a cinema and watch, while with questions we introduce the scientific aspect that is not necessarily criticizing the scientific concepts (none is asking which kind of ore kryptonite is or how can a small spaceship travel faster the light speed across the universe) but trying to find out how science and its relationship with life are treated. The discussion is a sort of triangular debate between the authors (or someone representing the movie), experts selected from the scientific or academic world (often from the University of Genoa itself) and the whole audience.

The closing session of the event, after five intense days, is the "Night of science fiction", a white night starting around midnight with three cult movies turning around a topic characterizing the edition of the event (e.g. The first Italian production, the German expressionism, the damned between 60's and 70's).

In front of a fiction, with all the extravagant and extraordinary ideas directors and writers developed, we are finally finding our common space. To stimulate the audience is not easy, to communicate science is often a challenge difficult to be faced without the classical creation of roles "teacher – lecturer" and "audience – pupil" that is probably liked by most colleagues but is at the same time creating that kind of fear and sense of wizard that surround science and its "ministries".

In fictions, doesn't matter if expressed by books or by movies, we find a distillate of the perception of science and society relationship. What the fears and hope of common people, what is the idea of science in a certain period (is it the answer to all questions, the rise of hope or the destructive tool?) and, of course, which role has the scientist and the scientific concept in the story or, as we prefer, in life.

The discussions help to create and consolidate the bridge between authors, scientists and the audience. We find each other in opponent roles, unpredictable at the beginning, which the scientist defending the wrong theory just because is nice to imagine the opposite of what we observe just to figure out how the universe would be if, the audience is participating actively (it is often the case that the owner of the cinema has to stop the discussions around 1 a.m. With the sentence "hey, guys tomorrow I start at 8!") and sharing ideas, fears, and interpretations, eager to be for once listened and to receive answers to questions. The authors are more than pleased because they are often using science as a tool of their subconscious and they can then see their work of art under a different light.

Is this communication and teaching science? Honestly we think so and after six years of experience we can talk about successful communication and increase in awareness. We cannot of course talk about increase of knowledge because it involves a longer process but an increase of awareness is probably resulting in widening the curiosity and therefore stimulating the quest for knowledge of people.

Being the audience composed every age people (from teenagers to retired) there is as well the solution of generations gap and the exchange is achieving the highest potential from the fresh minds of youngsters without experience and full of hope (are they always? Honestly no) and the deluded or still in love "old" people who believed in science.

However to be more consistent with this paper, meant to communicate how science fiction can be helpful to communicate science and in the real spirit of X_Science, let imagine to be in a cinema watching the following movies: Another Earth, Melancholia and a couple of episodes of Fringe. You didn't yet? Well it's time to do it.

In table I you will find a short description of the movie as you can find in Internet Movie Database (imdb.com). The movies are from 2011 while the episodes belongs to the first season of the serial (therefore they represent 2008) and the second half of the third season (spring 2011).



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The three works are turning around a similar topic, and it is not strange that two movies from the same year could be so similar without copying each other: two planets are meeting, one is our planet, one is a “new in town” or better to say “a new in the solar system” planet (for the movies), or our planet from a parallel universe in the TV serial.

Another Earth (2011), 92 min, **Director:** Mike Cahill **Writers:** Brit Marling, Mike Cahill **Main actors** Brit Marling, William Mapother and Matthew-Lee Erlbach **Plot** On the night of the discovery of a duplicate planet in the solar system, an ambitious young student and an accomplished composer cross paths in a tragic accident. **Keywords** Drama, Sci-Fi

Melancholia (2011), 136 min, **Director and Writer** Lars Von Trier **Main actors** Kirsten Dunst, Charlotte Gainsbourg and Kiefer Sutherland **Plot** Two sisters find their already strained relationship challenged as a mysterious new planet threatens to collide with the Earth **Keywords:** Disaster, Fear, Servant, No Opening Credits, Employer Employee Relationship, Sci Fi

Fringe (TV Series 2008), 60 min **Creators:** J.J. Abrams, Alex Kurtzman, Roberto Orci **Main actors** John Noble, Anna Torv and Blair Brown **Plot** A television drama centred around a female FBI agent who is forced to work with an institutionalized scientist in order to rationalize a brewing storm of unexplained phenomena. **Storyline** The FBI teams up with a formerly-institutionalized scientist - who was performing experiments on the fringe of real science - and his son to investigate weird crimes that are seemingly part of a larger pattern, and may be connected with a global company called Massive Dynamics **Keywords** Drama, Horror, Mystery, Scientist, FBI

Table 1 – Essential information about the quoted movies

There is the classical fear of another planet approaching (When worlds collide) with all astrophysical implication concerning the mess that another planet could create to our equilibrated solar system and this would ask the contribution of an expert that could try to explain how it works and how it might work or it can't work. But simply spotting errors in the movie is such a nerd approach not leading to any place. It is important to talk about planets and planets movement without losing the poetry (Melancholia).

There is the need of an expert talking about the theory of multiverses where parallel universes exist and if it is really possible that beyond the mirror we find ourselves with similar life but other opportunities (Fringe) or simply a parallel planet still belonging to this universe where we just had the chance to not mess up our life (the “wrong turn” of Another Earth).

Removing the surface we observe that in the three cases life as it is not enough is not satisfying, another planet is needed, or another life, another opportunity. Another planet represent the projection of a great fear (we are so small and so alone, as it arises from Melancholia) or of a great hope (as it is the case for Another Earth) and in both cases is the solution of intricate lives. Look around you and forget for a second your scientific eye but use your criticism, trained by years of laboratory tests, don't you see a suffering planet? Lived by suffering people? Economical crisis, Identity crisis, work crisis, we see our “western world” collapsing and new “eastern world” approaching. We see masses moving from a continent to another in search of “hope” and finding “closed doors”. Don't you see the “good old mother earth” our planet starving and asking for a new planet? This is the distillate of fears and perceptions of the authors and if the movie is appreciated is because it is talking directly to our subconscious life. A documentary about the solar system is self-consistent, at the end you have learned but you have only technical questions, while a movie is opening more doors and



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windows and the following discussion will fill the curiosity but also face other topics related to the movie and to the most “hot” topics for people.

A good scientist would then derive a message to make the research work more close to people expectations.

And what about scientists in those movies? In *Another Earth* she is the one with the chance of the first exchange with her double (who decided we are the first and the other is the double?). The role is important, the scientist (a woman as best mirror of civil evolution!) is creating the bridge. She has only a few minutes on the screen and is the only scientist met in all movie but she is positive and opening the dances. The Science is just explaining through the news that the second Earth was hidden by the Sun (something like two electrons on the same shell?!) and now is visible and we can organize mutual visits. There are of course errors and the revolution of the solar system concepts is hard to be digested. We have therefore to accept it as a dream, as we accept the existence of heaven and hell (see *Divine Comedy* from Dante Alighieri), and we have to see the hope that in another planet we might find answers and chances of a better life. Oops, my mistake, there is a second astrophysicist in the movie, the main character, but only a potential and never accomplished one because of a “bad turn” caused by the second Earth.

In *Melancholia* the dance of planets, with a nice quotation of the dance of orbiting stations from S. Kubrick 2001: *A space Odyssey* (1928), is a deadly dance, the planet that gives its name to the title of the movie is blue (wasn't Earth the blue planet?) and is larger than us, it's appearing after a long lasting run across the universe (it sounds like the far away planet of solar system Nimrod in which some people believe and passing nearby the sun every ten thousand years or so), dancing and then leaving all other planets and then meeting us. The first sequence is the end of the movie, the end that we'll never see again, made of deadly beautiful images of one big blue planet absorbing our small blue planet. The science more than the scientists are represented in this movie, but only in the second half of the story. The science comforts and explains, gives hope and fails, but none will be left to testify such a failure. Two worlds collide, the one of a psychotic depressive woman (the main character) and the one of British high class people, those being sure that nothing might happen or change. The one of those using the telescope and internet and all stuff to see the planet approaching and the one so those letting the pale light of the incoming planet caress their bodies.

The world and the movie are ending. There is no hope. The author is proposing this concept, there is no hope but letting things happen and living in the most natural way our life in harmony with the surrounding universe. This is a message or better a request of equilibrium. Science can explain but cannot save us. Trying for the right balance gives us the opportunity to live better the last hours. A movie like this one is opening a lot of questions where astrophysical aspects are important but marginal at the same time. The character looking for harmony is the one fragile in our world of certainty, the character believing in “what scientists said” is the one fragile when certainty is lost. The equilibrium is in the eyes of a kid, amazed by the event and holding the hand of both of the characters.

There is hope, and hope is in harmony while our planet is little by little (?) consumed by us and consuming its time (is the sun going to evolve to red giant one day or not?)

The parallel universe of *Fringe* is placing the two main scientific characters (two or better one great brilliant mind) one against the other. The same “total” scientist, with a knowledge covering all possible and impossible topics, giving a chance to any theory and finding answers to the most intricate and private fears and questions. The brilliant mind turning evil in one universe and “fool” in the other one. The brilliant mind that crossed the universe for love creating a continuous instability between the two universes where “only one can survive” (*Highlander*: “there can be only one”). Is this the main topic? It seems but it is not. The precious aspect of serials like *Fringe* is that they are created by group of episodes, with an evolving plot. The authors know



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vaguely the end of the season but are free to play and the test differing paths to join the end. End that is blur and can be modified.

The show business, the audit from the audience, seem to lead the choices made by the script-writers, and it is true, but what we observe is the society influencing the story with its perceptions, fears, hopes. Black and white, ying and yang, good and evil are represented in Fringe. We have a double for almost all characters and they are good or bad guys according to our point of view, with no absolute vision. This is a window on life where science is playing a very important role and where we can have a lot of fun discussing within our community that is not the scientific one but the humankind.

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