



JET PROPULSION THEATRE

Bringing out the *Human* side of *Science*

A project by Arditodesìo Theatre Company

Project Overview, Productions, Events and Workshops

A close-up photograph of a man with a theatrical or clown-like appearance. He has white face paint with dark markings around his eyes and mouth, and a full, dark brown beard. He is wearing a light-colored, textured vest over a white button-down shirt and a black and white horizontally striped long-sleeved shirt underneath. He is holding a dark, textured book against his chest with both hands. The background is solid black.

Taking Out Grandpa

What is JPT?

JPT is a **Permanent Laboratory** of the **Arditodesio Theatre Company** for the theatrical creation connected to science, the people of science and the scientific tale. Arditodesio is a well known Italian professional theatre company. The project was started in 2012 by Andrea Brunello and Stefano Oss.

JPT aims to **narrate science by means of theatre and artistic expression**, to develop a sense of curiosity and wonder, a thirst for knowledge, and to allow a better comprehension of the scientific world, the people that live it, the results of science and, bottom line, to better understand our present and future. JPT develops the concept of "**outreach**"!

A unique project

JPT uses **professional performing arts and education** to promote **science engagement** through theatre productions, festivals and non-formal education. Our work builds on **deep scientific content**. It lies at the interface between science and art, human beings and society, and the philosophy of science. JPT achieves its mission by connecting researchers, science facilitators, teachers and artists to reach out to students and general audiences.

Why?

The **knowledge gap** between those who understand the methods and implications of science, and those who don't, needs to be addressed. Schools, Universities, Science Museums and Centres are doing their part by teaching, researching and investing in outreach programs to share the knowledge they generate. Yet we feel that more can be done to **bring science closer to the laymen**, making them more curious, aware, engaged and critical citizens. JPT is part of the answer in addressing this need.

Our services

Our services include the creation and performance of original **science theatre productions**; the production of **augmented lectures**, involving scientists and artists; the organization of an annual science and theatre festival, the **Theatre of Wonder**. We also deliver composite **workshops** around storytelling and playwriting for teachers and science communicators.

Target group

The project engages with **Theatres, Festivals, Universities, Schools, Museums** and other cultural and scientific organisations. Special focus on high school and university students.

The people of JPT

ANDREA BRUNELLO is the **PROJECT DIRECTOR**. He holds a bachelor degree in physics and mathematics from Cornell University (USA, 1992) and a physics Ph.D. from the State University of New York at Stony Brook (USA, 1997). He is currently affiliated with the Physics Department of the University of Trento where he teaches a course on science communication. He has published articles in some of the most prestigious physics journals, most notably Physical Review Letters and Physical Review A.

In 2002 Brunello decided to follow his artistic side pursuing a full time professional theatre career. In 2010 he graduated from the three year program "SAT - SCHOOL AFTER THEATRE advanced training program" led by the Russian director and pedagogue Jurij Alschtiz. SAT is affiliated with the EATC/Russian Academy of Theatre Arts (GITIS) of Moscow (Russia).

STEFANO OSS is the **MAIN SCIENTIFIC ADVISOR** of the project. He is Professor of Physics and Head of the Physical Science Communication Laboratory of the Physics Department of the University of Trento (Italy).

PIERRE ECHARD curates the **INTERNATIONAL DEVELOPMENT** of JPT. He has 25 years of experience in managing international partnerships in the field of sustainability. Firm believer in creative collaborations at the crossroads between disciplines, he has strategically guided organisations and projects towards innovative solutions to sustainability challenges. JPT's approach to integrating science and arts convinced him in 2012 to support the international development of this unique project.

Fundamental collaboration

All the plays produced by JPT are extensively researched and reviewed by experts in the fields. The **primary partner** for the project is:

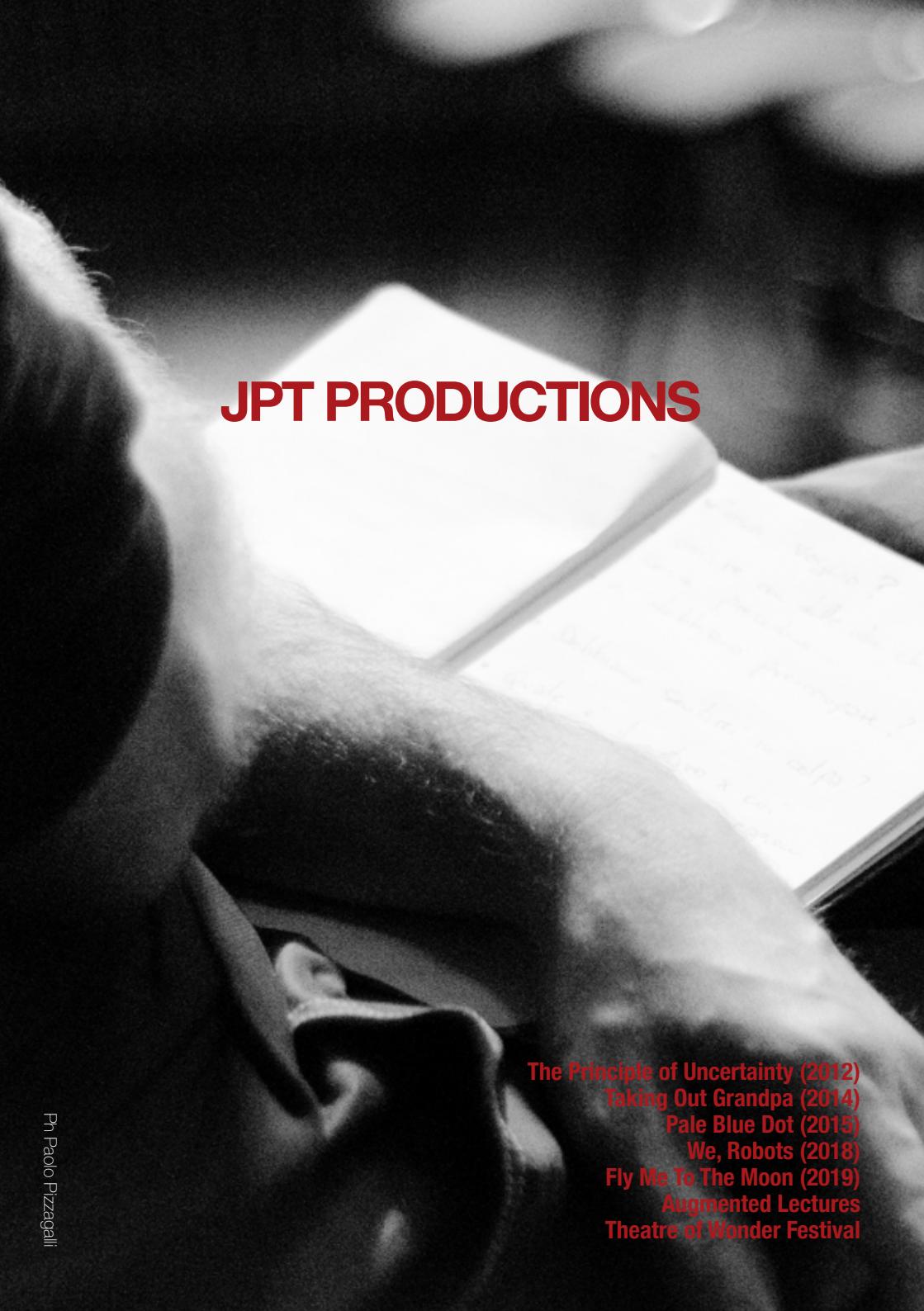


The Physical Science Communication Laboratory of the Physics Department of the University of Trento (Italy)

Where we have been

JPT plays and workshops have been held at **a great number of venues, festivals, theatres, universities and schools**. Here we mention some:

- . Edinburgh Festival Fringe
- . University of Warwick - U.K.
- . University of Bordeaux - France
- . KU Leuven - Belgium
- . Université Catholique de Louvain - Belgium
- . University of Trento - Italy
- . University of Milan "Statale" - Italy
- . University of Milan "Bicocca" - Italy
- . University of Bergamo - Italy
- . University of Bologna - Italy
- . ECSITE Annual Conference - The Hague / Netherlands
- . Edinburgh International Science Festival
- . Draper Hall - London
- . Re-Logia Festival - Sofia, Bulgaria
- . Sound of Science Festival - Mortsel, Belgio
- . Next Einstein Forum 2018 - Rwanda
- . Summer Scriptwriting Base - Bulgaria
- . Genoa Science Festival
- . BergamoScienza
- . Turin's Theatre and Science
- . International Centre for Theoretical Physics in Trieste - Italy
- . The Joint Research Center for the European Commission in Ispra/Varese - Italy
- . BOZAR - Brussels, Belgium
- . Sofia Science Festival - Bulgaria
- . Falling Walls Engage - Berlin, Germany
- . Scientix SPNE - Athens, Greece
- . Hardin Planetarium, W. Kentucky Univ. USA



JPT PRODUCTIONS

The Principle of Uncertainty (2012)
Taking Out Grandpa (2014)
Pale Blue Dot (2015)
We, Robots (2018)
Fly Me To The Moon (2019)
Augmented Lectures
Theatre of Wonder Festival



Ph Monica Condini

The Principle of Uncertainty

A quantum mechanics lecture. A man who loves the Universe. The scientific method that clashes with pseudoscience. A secret...

THE PRINCIPLE OF UNCERTAINTY

Inspired by **Richard Feynman** and **dedicated to our children**

With **Andrea Brunello** and **Enrico Merlin**

Text by **Andrea Brunello**

Music by **Enrico Merlin**

Directed by **Andrea Brunello** and **Michela Marelli**

Lights and technical support by **Andrea Lucchi**

Drawings by **Salvatore Crisà**

In collaboration with

The **Physical Science Communication Laboratory** of the physics Department of the
University of Trento (Italy)

A professor walks through some of the most **mysterious concepts of quantum mechanics** (the double slit experiment, Schroedinger's cat, the many-worlds of Hugh Everett III) to present a wonderful world made of mysteries and paradoxes. But in the midst of all that awe-inspiring joy lies **a disquieting truth**. The lecture turns into a confession that mixes some of the most advanced ideas of quantum mechanics with **the professor's secret**, pushing him into an extreme, final decision.

To support the stage work of Andrea Brunello there is the musician Enrico Merlin. The connection between voice and music, text and sounds brings the audience to experience a **deep theatrical experience** without ever denying the **rigorous scientific contents** of the play.

It must be seen, even if you think you can't understand physics. (Silvia Tozzi - OublietteMagazine.com)

Prepare for a science lesson which will leave you dabbing your eyes. - (Three Weeks - Edinburgh)

Thought provoking fusion of science, music and theatre [...] Can humans and bees both appreciate beauty? Can the notion of parallel universes help us deal with death? The piece challenges you to question everything in a way that is fresh and provocative. (Sally Stott, The Scotsman)

I have been literally fascinated by this performance: a simple and yet deep and moving show. A very empathic play and intellectually brilliant. (Emanuela Dal Pozzo, Traiettorie.org)

Keywords: Richard Feynman, Theatre, Quantum Mechanics, Wonder, Beauty, Double Slit Experiment, Schroedinger, Cats, Parallel Universes, Live Music, Hope, Galaxies, Probability, Scientific Truth...



TAKING OUT GRANDPA

With **Roberto Abbiati** and **Andrea Brunello**

Directed by **Leonardo Capuano**

Text by **Andrea Brunello** with the collaboration of **Roberto Abbiati** and **Leonardo Capuano**

Scenes by **Roberto Abbiati**

Costumes by **Patrizia Caggiati**

Lights by **Marianna Tozzo**

In collaboration with

The **Physical Science Communication Laboratory** of the physics Department of the

University of Trento (Italy)

The **Fondazione Bruno Kessler**

Where does passing time go? This is the question that **Albert Einstein** asked himself when he attempted to find a symmetry between space and time. **Physicists literally do not know where Time goes!** And where it comes from! What is time made of? Has it had a beginning? Will it have an end? Can we travel through time? What paradoxes are we likely to find? **What is the Arrow of Time?**

Taking out Grandpa deals with these questions but in **a very human, emotional way**. An old man in his deathbed invokes his grandfather: "where does passing time go, Grandpa?". But his grandfather is long gone... only his spirit survives, he is a ghost, a dream, a vision.

Science meets Waiting for Godot meets Saint Augustine meets Einstein... to the rhythm of Radiohead!

A fun and poetic, engaging and extravagant WAY to reflect on physics, to deepen the human side of science. (Vincenzo Sardelli, Scuola e Amministrazione)

Exceptional performance by the two actors that have conquered, more than once, big open stage applauses, and that have turned their show into a big celebration of life and of the "present" time. (Michela Bottanelli, Persinsala)

Keywords: White and Augusto Clowns, Aging, Physics, Thermodynamics, Arrow of Time, Einstein, Newton, Quantum Mechanics, Big Bang, Photons, Relativity, Time Perception, Time Travel, Paradoxes, Radiohead, Quantum Entanglement...



The climate. The Voyager. Our Planet. A revolution will save us. Or will it?

PALE BLUE DOT

Inspired by **Carl Sagan**

Text by **Andrea Brunello** with the support of **Christian Di Domenico**

With **Andrea Brunello**

Directed by **Christian Di Domenico**

Scenes **Roberto Abbiati**

Music composed and played by **Enrico Merlin**

Light design **Elena Piscitilli**

Costumes **Patrizia Caggiati**

Artistic support **Salvatore Crisà**

With the technical support of **Roberto Tiella / Fondazione Bruno Kessler**

In collaboration with

The **Physical Science Communication Laboratory** of the physics Department of the
University of Trento (Italy)

The **University of Bordeaux** and with the support of **IdEx Bordeaux** and research centers **IRSTEA**
and **Labex COTE** (University of Bordeaux - France)

An **amazing story of hope, wonder, beauty and despair**. The destiny of the spaceprobe Voyager 1 entwines with that of its suicidal creator, that of his dreamer son and that of Planet Earth. As the spacecraft gets farther away from the solar system, everything falls into perspective, it becomes painfully clear that **our little Pale Blue Dot, the Earth, is the most precious of spaceships** and it needs to be protected with **no hesitation and no compromise**. **Why are we not fixing it?** Are we not "engineered" to do it? **Have we not the intelligence?**

But when it all seems lost, an amazing revolution seems to take place. It is draconian and necessary. The **fatalistic sense of inevitability** is lifted from our souls and our social structure is forever changed for the better. **But did it happen really?** Could it happen really? Or is it just utopia, a wishing tale that needs to be told and then sent to Voyager 1 so that it can keep a last, final relic of a civilisation that **may as well have reached its end?**

Pale Blue Dot is a very passionate monologue, sobering denouncing and asking questions. It's an educational format, a lesson that condenses information and vision.

(Vincenzo Sardelli, Krapp's Last Post)

This narration has a clear theatrical structure [...] very long applause.

(Valeria Ottolenghi, Gazzetta di Parma)

Andrea Brunello's skills are excellent. He manages to bring us to take the side of science.

(Veronica Vezzosi, fermataspettacolo.it)

Keywords: Solar System, Planet Earth, Venus, Jupiter, Climate Change, Global Warming, Hope, Carl Sagan, Voyager, NASA, Jet Propulsion Laboratory, Apollo 8, Apollo 11, Apollo 13, Capitalism, Greenhouse Effect, CO2, Acidification, Plastic, Ozone, Galaxies, Life, COP21, Kyoto...



WE, ROBOTS

Inspired by **The Bicentennial Man** and other works of **Isaac Asimov**

Text by **Andrea Brunello**

With **Laura Anzani** and **Andrea Brunello**

Directed by **Chiara Benedetti** and **Andrea Brunello**

Lights by **Federica Rigon**

Video **Valerio Oss**

Music consulting **Enrico Merlin**

Supervision on philosophical matters **Enrico Piergiacomi**

A special thanks to **Caterina Freda**

In collaboration with

The **Physical Science Communication Laboratory** of the physics Department of the
University of Trento (Italy)

In **Bicentennial Man** the great visionary **Isaac Asimov** describes a humanoid robot that longs to become human. But its desire can't be fulfilled because of its intrinsic nature, first of all its lack of mortality. Nevertheless it shows all the characteristics of a good human being: It is compassionate, creative, it has desires and it feels pain... **Maybe "it" can become a "he"?**

We, Robots is a play about **what it means to be human**, and what love is in the age of robots. It is a play about the connection between our brains and that of machines. In this play two "individuals" discover that the relationship man/machine is not so simple and it can lead to **insurmountable paradoxes**.

This JPT production investigates in a careful and precise way our most wonderful organ, the brain, and at the same time it aims at understanding where the field of Artificial Intelligence is going, **how are our artificial "brains" evolving?** Moreover, the play makes an explicit connection with the "other collective brain" of ours, the whole Universe seen as a complex system in many ways very similar to our brain (starting with the peculiar notion that there are approximately **100 billion neurons in the brain and approximately 100 billion galaxies in the Universe we can observe!**).

We, Robots connects beautifully with a completely poetic perspective: the human brain is deeply connected to something greater than us, something infinite like the universe. It is the origin of a potentially unlimited soul and yet it has a very human ambition, which in itself is incredible: to reproduce mankind through technology - Chiara Musati / www.milanoteatri.it

Here you can find a teaser video: <https://vimeo.com/241835302>

Keywords: Isaac Asimov, Future, Robot, Brain, Intelligence, I.Q., A.I., Astrophysics, Cosmic Web, Quantum Computing, Machine Love, Soul, Clone, Emulation, Brain Surgery, Life, Human, 100 Billion, Universe, Galaxies, Machine Learning, Love,...



A man, a woman and the Moon. An obsession that cannot be quenched.

FLY ME TO THE MOON

Text **Andrea Brunello**

With **Laura Anzani** and **Ettore Distasio**

Direction and light design **Fabrizio Visconti**

Scenes **Marco Muzzolon**

Costumes **Mirella Salvischiani**

Supervision on scientific matters **Stefano Oss**
and **Vladimir Bozhilov** - Dept. of Astronomy, Faculty of Physics, Sofia University, Bulgaria
Supervision on philosophical matters **Enrico Piergiacomi**

In collaboration with
The **Physical Science Communication Laboratory** of the Physics Department of the
University of Trento (Italy)

Adam is an Apollo Mission Astronaut. A very good one. **He has a dream: to reach the Moon.** He is ready to sacrifice everything, wife, children, family, health, even his own life in order to get there.

Valentina is a woman, a mother of two children and the wife of Adam. She is strong, intelligent, determined and in many ways she has an "astronaut" soul, just as much as Adam.

Fly Me To The Moon is the story of **their relationship told in the shadow of the mighty Saturn V missile and the Apollo Project.** It's the story of an unbalanced love between her and him and the Moon, an all absorbing dream that, for its very utopian nature, continuously risks to become the cause of their destruction.

But Fly Me To The Moon is also about **human ingenuity and the science** that had to be developed in order to bring humans far away from the Earth. It's about the Moon, **our celestial companion**, and its amazing characteristics. The play is a tribute to the fascination that we humans have felt for our nightly companion since the beginning of time and to our desire to learn, to be curious, to never stop exploring.



**The play will have its world premiere on
July 20th 2019, 50 years since the first lunar landing!**

Keywords: Moon, Earth, Physics, Astronomy, Geology, Space Exploration, Engineering, Newton, Gravity, NASA, Apollo Missions, Dreams, Courage, Passion, Competence, Luck...



Courtesy of ESO



AUGMENTED LECTURES

What happens when science communication meets poetry, theatre, music, video, or figurative arts? What common ground can be found when you turn scientific storytelling into an artistic endeavour? **Science and Art both explore and create new ideas inspired by the world that surrounds us**, and this programme provides the conditions for scientists and artists to **work together**. JPT's **Augmented Lectures connect scientists with artists** (often times chosen **from outside of JPT**) so they can interact and create novel ways to communicate science, to engage science in the arts and to develop new pedagogical tools. **JPT provides coaching and direction**, but the results depend on the performers' inclinations. Here below are just some examples of what we have been doing...



The last walk on the Moon

The incredible adventure of the Apollo missions and of the astronaut Eugene ("Gene") Cernan, the last man who walked on the moon.

By and with **Stefano Oss** - Department of Physics of the University of Trento and with the musician **Enrico Merlin**



Dante the Cosmonaut

Dante had (perhaps) understood everything... the Big Bang and God are the same thing?

by **Anna Pegoretti** (Department of Humanities, University Roma Tre) and **Leonardo Ricci** (Department of Physics, University of Trento) with Anna Pegoretti and the actress **Laura Anzani**



Things from the Anti-World

The story of how we came across antimatter and how, however, we have not (almost) ever seen it.

By and with **Roberto Iuppa** - Department of Physics of the University of Trento and with the sand artist **Nadia Ischia**



Wharton
UNIVERSITY OF PENNSYLVANIA

SEI Center
FOR ADVANCED STUDIES
IN MANAGEMENT



The Augmented Lectures received the **CULTIVATING CURIOSITY Bronze Award** at the **2016 Reimagine Education Conference**, organized by The Wharton School – SEI Center at the University of Pennsylvania and QS Quacquarelli Symonds, compiler of the QS World University Rankings.



UNIVERSITÀ DEGLI STUDI
DI TRENTO

Dipartimento di Fisica



Opera Universitaria di Trento



TEATRO della RAVIGLIA 2019

Festival di Teatro e Scienza
Dal 18 al 23 Febbraio 2019
TEATRO SANBÀPOLIS

al

Un progetto
curato da

 compagnia
arditodesio

 JPT
JET PRODUCTION THEATRE

THEATRE OF WONDER FESTIVAL

Teatro della Meraviglia is a festival of theatre and science narration organized in Trento (Italy) by Jet Propulsion Theatre / Arditodesio Theatre Company, Teatro Portland, the University of Trento and the Opera Universitaria.

The first “pilot” edition was organized in **January 2017** while the second edition took place in **February and March 2018**. All together more than 3000 people attended the two editions for what has been considered a tremendously successful festival **whose format can be replicated in other cities and Universities**. As a matter of fact, we are currently setting up the conditions to create an **International Project** centered upon the Festival. The expertise gained in organizing the first two editions and the results that were obtained have given us the confidence that the format has the potential to become widespread throughout Europe.

In Trento we managed to move hundreds of students and to motivate many of them to act as **volunteers** during the festival. Many of the audience members have come to each and every event and all in all we have been overwhelmed by the emotional response that our science-theatre events have generated. The next edition of Teatro della Meraviglia is planned for **February 2019**.

For further information regarding the festival, visit www.teatrodellameraviglia.it





JPT WORKSHOPS

1: Playwriting Science
2: Storytelling Science

PLAYWRITING APPLIED TO SCIENCE

HOW TO CREATE A GRIPPING STORY

STARTING FROM A SCIENTIFIC IDEA

Topic Overview

This workshop provides practical tools and experience for **translating a scientific idea into a story** apt for science storytelling and popularization. The workshop focusses on creative writing techniques and it includes practice exercises.

Target

Science popularizers, science teachers, university professors, teachers in higher education, researchers, science writers, students, theatre and performance artists.

Schematic overview

The basic elements of **playwriting** are presented. The participants propose a number of **science topics** that they would like to develop during the workshop. These topics are analyzed and the most interesting ones are chosen for the work and they become **the basis of the stories and plays**. An in depth writing, reading of the material and subsequent analysis is performed where the participants are required to write and discuss their work as well as that of others **under the guidance of the conductor**. The final results can eventually be staged.

Participants and Time

The number of participants and the duration of the workshop will be decided depending on availability and constraints. In any case care should be taken to ensure that there is enough time to devote to the **development of individual needs**. The participants may be asked to produce work outside of the workshop periods.

The workshop is conducted by Andrea Brunello. Other professionals could be involved depending on specific needs.

2

STORYTELLING TECHNIQUES AND THEATRE TRAINING METHODS FOR SCIENCE TEACHERS AND POPULARIZERS

Topic Overview

Very often arises the need for speaking in public: during a conference, when giving a lesson, to present a research project, to ask for a grant... but just as often we may feel **uneasy about the challenge**. This very practical workshop helps the participants to better understand their audiences, tailor their messages to them, and convey ideas powerfully using storytelling and other performing arts techniques.

Target

University professors, researchers, science teachers, science writers, students and science popularizers.

Schematic overview

The workshop is divided in Three Modules:

(1) Perspective, understanding and defining - This module will enable us to take a step back from the detail of what we wish to communicate, to situate it in a wider context, learn about our audiences and how to adapt the key messages to them.

(2) Storytelling - By using aptly modified theatre training and storytelling techniques we open up to the audience and become better public speakers.

(3) Prototyping and Testing - Here we integrate modules 1 and 2 into very practical and engaging exercises. We will practice delivering the content and, by means of trial and error, learn to maximize the impact of our performance.

Participants and Time

The workshop is usually delivered in 18 hours spread over 3 days. Ideally participants are limited to 18. The workshop structure and duration **can be tailored** to the organizers' needs and resources available.

The workshop is conducted by Pierre Echard and Andrea Brunello. Other professionals could be involved depending on specific needs.



WWW.JETPROPULSIONTHEATRE.ORG



Ph Courtesy of NASA

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