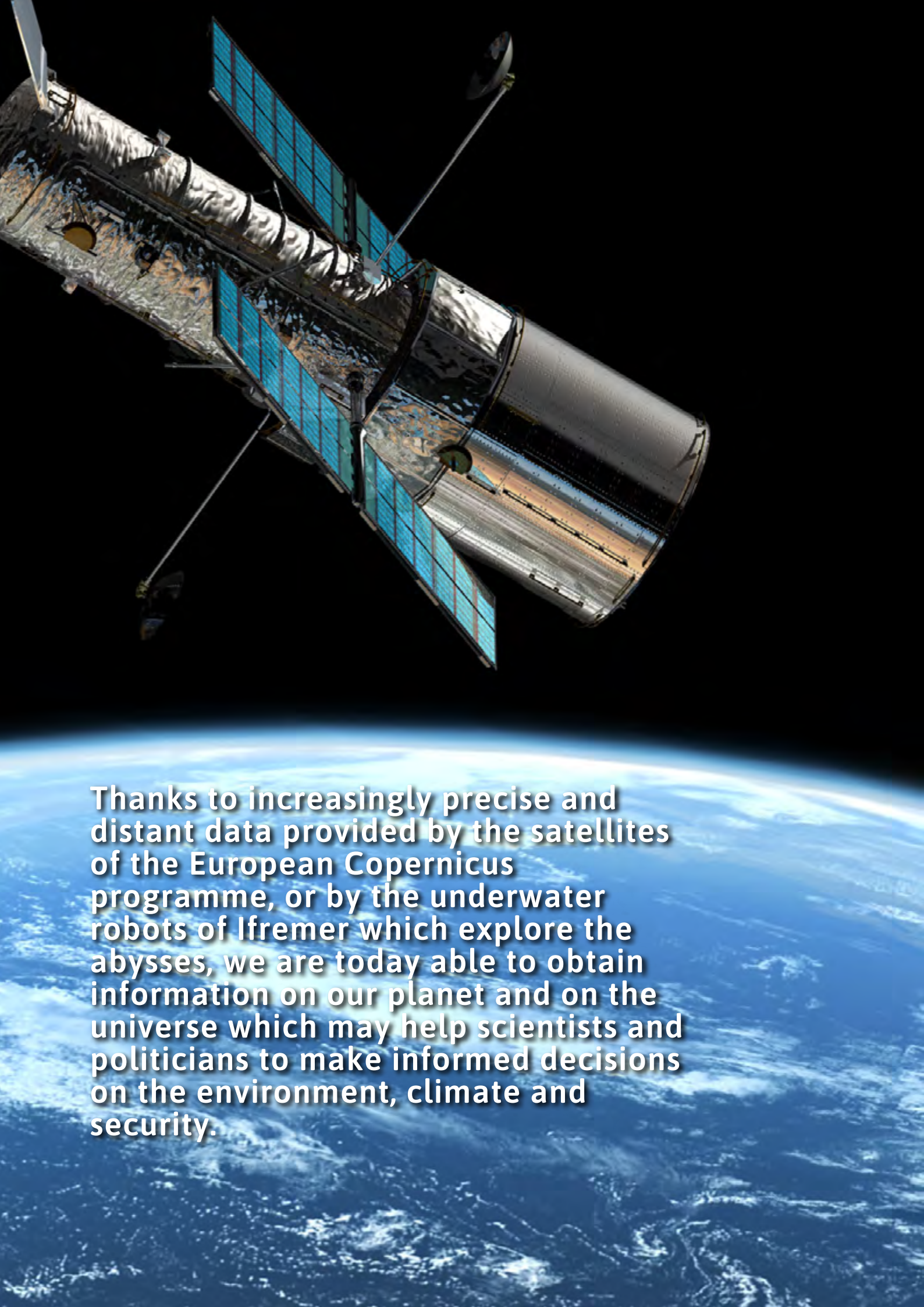


Multimedia show combining arts and sciences

FROM THE ABYSS TO THE STARS

STORIES FROM THE CONFINES

Season 2025 - 2026



Thanks to increasingly precise and distant data provided by the satellites of the European Copernicus programme, or by the underwater robots of Ifremer which explore the abysses, we are today able to obtain information on our planet and on the universe which may help scientists and politicians to make informed decisions on the environment, climate and security.

A visual concert that takes us to the confines

On the initiative of the Polychronies percussion ensemble, extended to woodwinds and strings, the idea of a multimedia show was borne, structured around two musical electro acoustics creation, one turned towards the abysses and the other towards the stars, performed by the Polychronies ensemble opening its workforce to woodwinds and strings (flute, bass clarinet and cello).

This show is made possible by the collaboration of scientific establishments (Mines Paris - PSL, Université de Toulon, Ifremer), which are making available to the creators observation data recorded by satellites and underwater robots from the cosmos and the sea, two spaces at the edge of the universe, still bathed in mystery. This data, brought back into the audible and visible spectrums to man, will produce sound and visual base materials that will feed and inspire multimedia creation.

A narrative punctuates the progression of music and visual events projected in real time onto several screens. It has an informative, didactic, but also poetic and wonderful function. Alongside the musicians performing the works, it is brought to life through the actions of the narrator, a sort of modern-day explorer who ponders the ecological, scientific and philosophical issues facing humanity in the 21st century.



Outdoor concert by the POLYCHRONIES ensemble at Toulon's Tour Royale

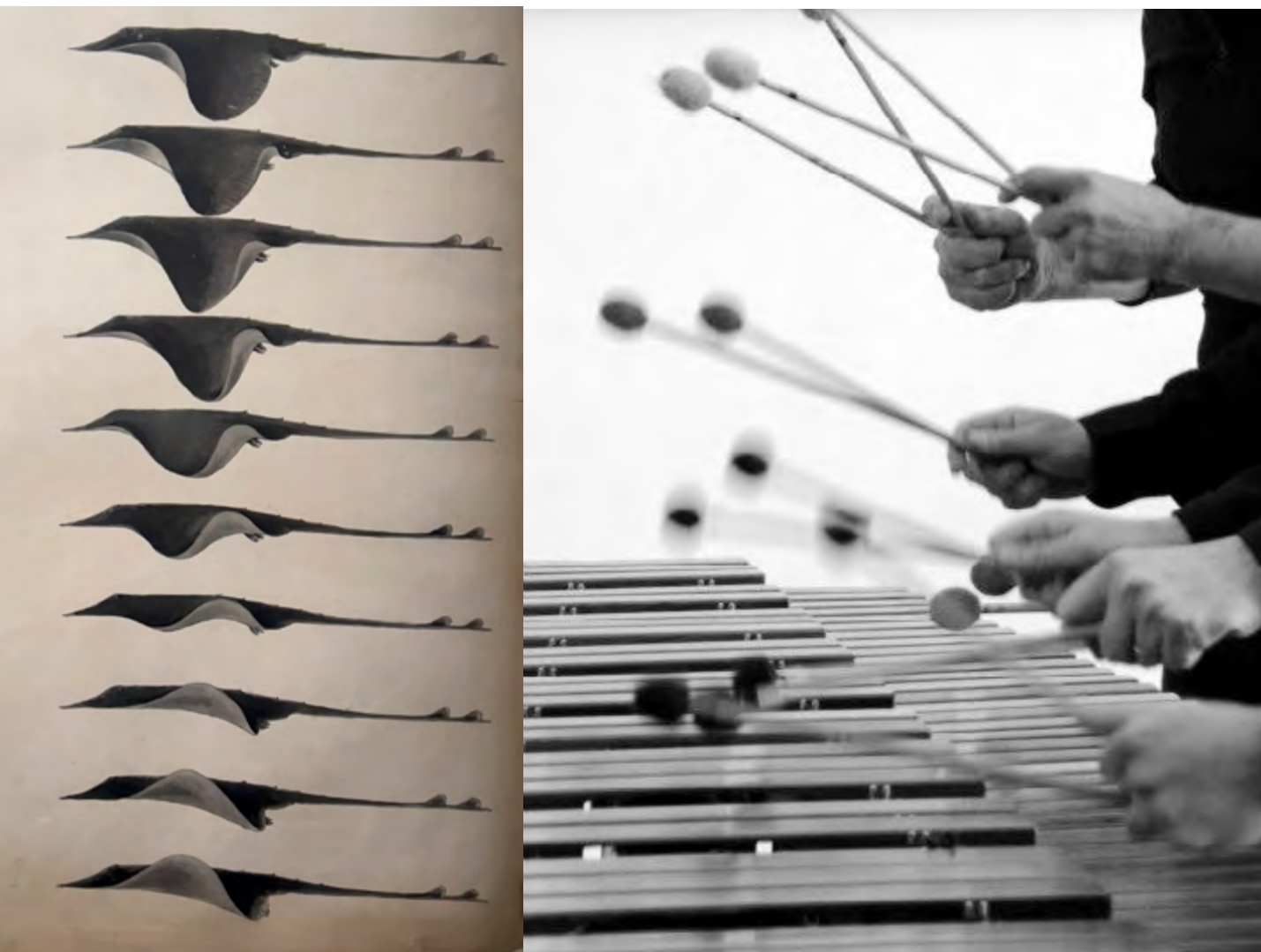
PRODUCTION OF THE SHOW

A co-production

Mines Paris – ITN (Institute of Digital Transformations) - Executive Producer,
Crescendo- Apjm (Association for the promotion of young musicians), Polychronies/2cdm (Collective for the creation and diffusion of music)

with the support of

Béla Compagnie, Fondation Mines Paris, Ifremer, Ircam projet REACH, University of Toulon.



Chapters of Jacques Keriguy's text

Prologue

Seeds of the ocean

Genesis, introduction

The navigator, the explorer

The discovery of the abyss

Visions of the future

Embracing the Universe

Prelude

Cosmogonies

Beyond the galaxy

Epilogue





Among the first forms of life in the original sea: Jellyfish.

PROJECT STAKEHOLDERS

Steering committee:

- **Brigitte d'Andréa-Novel**, professor at École des Mines de Paris, director of the Institute of Digital Transformations of Mines Paris (ITN) and president of Crescendo-APJM.
- **Florent Fabre**, artistic director Polychronies/2CDM.
- **Guy Herrouin**, marine domain expert.
- **Jacques Keriguy**, president of Polychronies/2CDM.

Artistic team:

- **Ensemble Polychronies**: Bernard Boellinger, Florent Fabre, Bernard Pereira, Mathieu Schaeffer: percussions, joined by **Thomas Prévost**: flute, **Marc-Antoine Novel**: cello and a bass clarinet (cast in progress).
- **Kazuko Narita**, composer of the "Abysses" part.
- **Lara Morciano**, composer of the "Stars" part.
- **Gérard Assayag**, research director at **Ircam**, coordinator of the European ERC (European research council) project "REACH" (Raising co-creativity in cyber-human musicianship), electro-acoustic production.
- **Jacques Keriguy**, author of the texts.
- **Actor(actrice)**, cast in progress.
- **Mark Blezinger**, director, multimedia creation, artistic director Béla Compagnie.

Bottom: Photograph of Sagittarius A, a gigantic black hole discovered in our galaxy, the Milky Way, taken by the Event Horizon Telescope (Eht) Collaboration validating Albert Einstein's theory of general relativity.

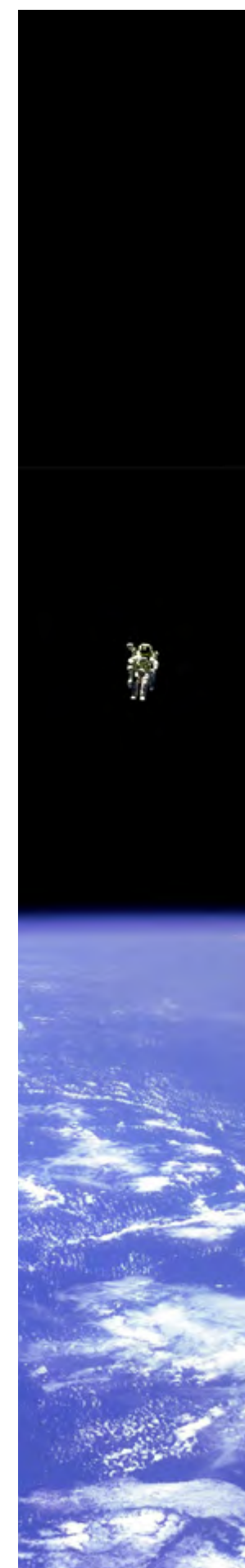
Bottom right: Self-luminous deep-sea fish

Right page: Astronaut floating above the Earth during an outing of the international space station ISS.



Scientific team:

- **Brigitte d'Andréa-Novel**, professor at Mines Paris, director of the ITN.
- **Philippe Blanc**, research director at the O.I.E Center (Observations – Impacts – Energy), head of the "Energy and processes" department at Mines Paris.
- **Students at Mines Paris 2A** from the "Earth and Universe data management project" as part of the DATA research period in Sophia-Antipolis, under the supervision of Philippe Blanc. The principle is to sonify and classify electromagnetic and gravitational waves, according to pitch, timbre and rhythm parameters. This digital data will constitute the basic material of the composers.
- **Sandrine Mathieu-Blanc**, Deputy Director of the Department of Space Science and Earth Observation „Acri-St Observation of the Earth and the Universe and Data Management“. Philippe and Sandrine will provide the Copernicus image databases that will be used for the visual illustrations.
- **Hervé Glotin**, scientific manager of bioacoustics, LIS Laboratory (Computer science and systems laboratory) for the acoustic and ecological study of the seabed, professor at the University of Toulon, specialist in underwater bioacoustics (particularly cetaceans) and also in deep learning.
- **Claire Dune**, researcher in underwater robotics at the Cosmer laboratory (design of mechanical and robotic systems), at the origin of the „robot ropes“ for exploring the abyss.
- **Valérie Michel-Fauré**, researcher in the history of contemporary art and professor at Esad TPM (École supérieure d'art et design - Toulon Provence Méditerranée) and at the Camondo school in Toulon. Interested in the acoustic and ecological study of the seabed, which she studies with her students, particularly through projects in immersive environments.
- **Vincent Rigaud**, director of the Ifremer Centre of the Mediterranean and **Guy Herrouin**, honorary director.



Broadcasting locations (under discussion, June 2024)

- **Toulon**
- **Paris**
- **Tokyo**
- **Athens**
- **Karlsruhe**

Images taken by satellites made available by the team of Philippe Blanc, director of research at the O.I.E. from Mines Paris

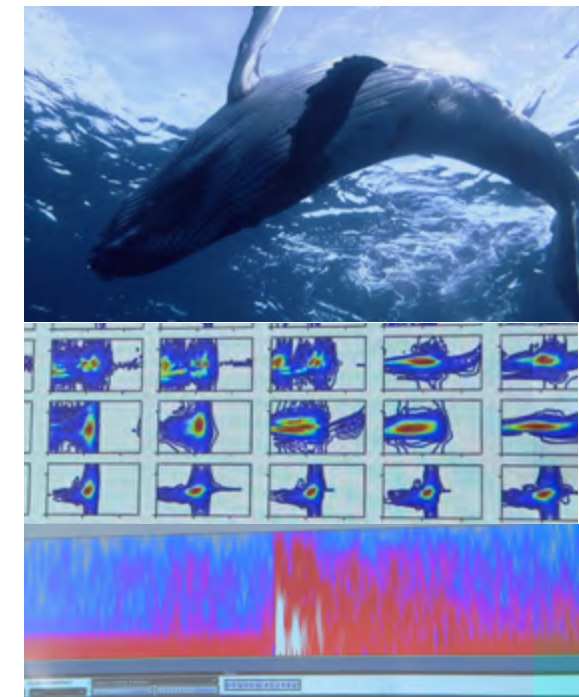


As an extension of the show: conferences and exhibitions

Non-stage events will be held in parallel (conferences, workshops, exhibitions, etc.) and will irrigate the venues by highlighting the “research/teaching/creations” articulations dear to the university.

Already planned are:

- conference in Paris (or Sophia-Antipolis) on data from the earth and the cosmos, sonification of gravitational waves, computer music; participation of Japanese researchers (University of Tokyo);
- conference in Toulon related to the sea, underwater acoustics, the mysterious life of the deep sea and marine biophony as an indicator of biodiversity; participation of Japanese researchers;
- thematic exhibition in resonance with the project, carried out under the aegis of the Arc Latitude 43: Interdisciplinary research and creation workshop led by researchers from the Esad TPM, the University of Toulon and the Camondo school.



Visualization of sound recordings of cetacean communication made with hydrophones by Hervé Glotin's team from the LIS.



BIOGRAPHIES

Polychronies

Created in 1998 by Florent Fabre, Polychronies is a chamber music ensemble with variable geometry built around percussion, dedicated to modern/contemporary repertoires and creation. Polychronies initiates or contributes to the emergence of projects bringing together creators and production/broadcast locations: Cncm of Marseille, Nice and Reims, Ncpa (Beijing), International Screen Music Festival, Scène nationale de Châteauvallon-Liberté, Festival d'Ile de France, Operas of Reims, Lille, Marseille) and specialized training centers (Higher Art Schools, Conservatories and Universities of Toulon, Sydney, Brisbane, etc.).

Two main axes of our actions:

- percussion quartet concerts.
- shows developing the transversality of artistic expressions within the framework of which we widely open our workforce:
 - **Yume** (chamber opera). Music: K. Narita with Y. Oida, K. Ito and traditional Japanese puppets.
 - **The 7 doors of Corto** (musical theater). Music J-M Machado; texts J.Serenna/J. Jouanneau. Co. The noise of men.
 - **Sarcophagus** (music and video), after P. Christin and E. Bilal; music: J.-M. Bossini.
 - **Tsunemasa** (ballet) with Cie humaine (E.Oberdorff).
 - **One of these days**, cartoons by B. Plympton, music: Franck Zappa or **A crazy page**, on Kinugasa's masterpiece (cine-concerts).
 - **The Abandoned Son** (monodrama directed by J.-C. Berutti), music by K. Abe with C. Morillon.



Bernard Boellinger, percussions

After his percussion studies at the CNR of Nancy then at the CNR of Strasbourg with Jean Batigne (founder of Percussions de Strasbourg), he devoted himself to various musical experiences: Young Public Theater of Strasbourg, Accroche note, Noco music, Macumba.

Regularly requested by prestigious orchestras (Orchestre de Paris, Philharmonique de Radio France, Toulouse, Monaco, etc.) he is principal timpanist of the Marseille opera orchestra and one of the rare French timpanists to play on mounted natural skins on high-tech instruments that he helped to develop.

He is a coordinating professor of percussion at the CRR of Toulon Provence Méditerranée, responsible for the "timpani" module, regularly takes part in timpani master courses and classes (Académie Tomasi, Percupassion, Epsival, etc.) and writes educational articles in specialized journals.



Florent Fabre, percussions

Florent Fabre studied with Georges Van Gucht, founding member of the Percussions de Strasbourg with whom he obtained his instrumental and chamber music prizes.

Independent percussionist in lyric and symphonic orchestras (mainly Marseille and Toulon) and soloist in chamber ensembles such as Les Percussions de Strasbourg or Musicatreize, he founded the Polychronies ensemble in 1998, of which he is artistic director.

He has participated in numerous recordings and played regularly in festivals such as Les Mancas, Les Musiques, the Festival d'Ile de France, Présences, Virginia Arts Festival, Ncpa Percussion festival in Beijing, La roque d'Anthéron, Washington DC, Montpellier / Radio-France, creating numerous composers (R. Gagneux, A. Markéas, P. Burgan, P. Zavaro, T.P. Challulau, K. Narita, C. Roque-Alsina, K. Abe, P. Burgan, N. Frize, J.M. Machado ...), often during multi-media shows, in collaboration with choreographers, visual artists and directors (A. Prejlocaj, P. Barrat, K. Ito, E. Ruff, Y. Oida, P. Christin, E. Billal). Author of several reports on specialized music education, he has led workshops at the University of Aix-Marseille and with Les Percussions de Strasbourg. He is currently a professor in charge of the "multipercussion" module at the CRR of Toulon-Provence-Méditerranée.





Bernard Pereira, percussions

Bernard Pereira studied percussion at the Conservatoire National Supérieur de Musique de Lyon where he obtained a first prize with François Dupin (Orchestre de Paris) and Georges Van Gucht (Percussions de Strasbourg).

He then taught at the CNR of Lyon and at the same time worked as an independent percussionist in various groups such as the Orchestre National de Lyon, the Opéra national de Lyon, the Radio-France Philharmonic Orchestra, the Orchestre de Paris. He also distinguished himself in the field of chamber music as a soloist in the Percussions Claviers de Lyon quintet.

Since 1999, he has been a percussionist at the Marseille Opera.

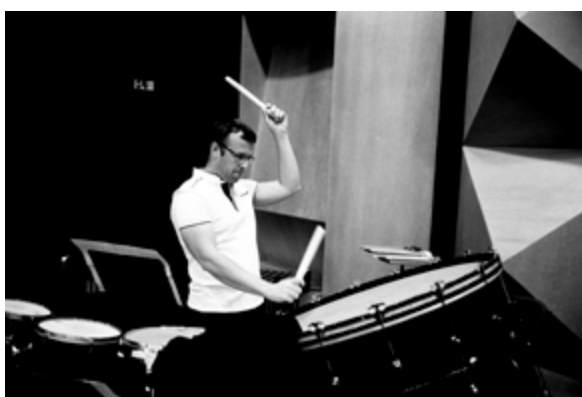
Mathieu Schaeffer, percussions

Mathieu Schaeffer graduated from the Strasbourg Conservatory (unanimously awarded gold medal with congratulations from the jury).

He then obtained a concert diploma (excellent mention and congratulations from the jury) at the Geneva Conservatory.

Eager to improve his skills in the orchestral repertoire, he then joined the ENM in Créteil. Since 2008, he has held the position of solo percussionist at the Marseille Opera and is regularly engaged by several orchestras and ensembles as an additional musician or as a soloist : National Orchestra of Toulouse, Philharmonic orchestras of Nice and Strasbourg, Opéra national du Rhin, Symphony Orchestra of Mulhouse and Nancy, national orchestras of Lorraine and Montpellier, Grand Théâtre de Genève, Orchestra of French-speaking Switzerland,...

His passion for chamber music has led him to participate in numerous festivals (Musica, Archipel, Nuits de Fourvières, Festival d'Aix-en-Provence...) and to the creation of numerous contemporary works by working with composers such as Mauro Lanza, Régis Campo, Jean-Claude Petit, Yan Maresz, Thierry Lancino...



Thomas Prévost, flute

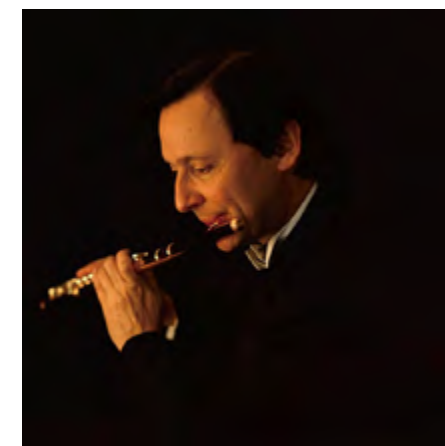
Thomas Prévost studied from the age of 10 to 17 at the Geneva Conservatory in the class of André Pépin, solo flautist of the Orchestre de Suisse Romande, where he obtained his Virtuosity prize. That same year, he entered the Conservatoire national supérieur de musique de Paris in the flute class of Jean-Pierre Rampal and, for chamber music, of Christian Lardé. He won first prizes in these two classes. He completed his studies in the third cycle of chamber music and won the prize at the Montreux international competition.

During his studies, he began working in different orchestras, under the direction of conductors such as Karl Boehm, Leonard Bernstein...

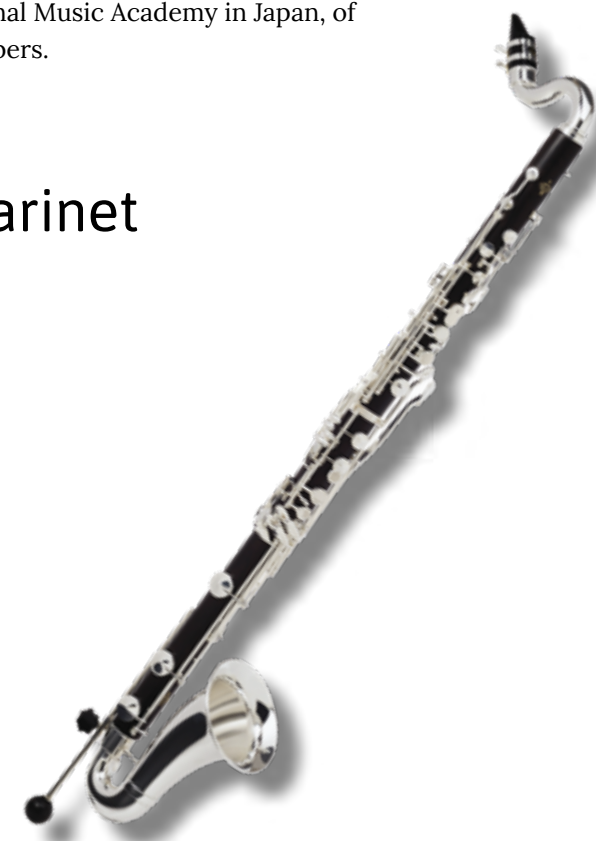
He passed the entrance exam for the Ensemble Intercontemporain created by Pierre Boulez, and subsequently, the super soloist flute competition for the Radio France Philharmonic Orchestra, a position he chose. As a soloist he plays with the Philharmonic Orchestra of Radio France, Monte Carlo, Rochester, Shanghai, Kanazawa, the Karuizawa festival...

Passionate about chamber music, he plays in numerous ensembles, Paris Instrumental Quartet, Nielsen Quintet among others, and with musicians such as Lily Laskine, Peter Schreier, Emmanuel Ax, Yoyo Ma, Pamela Franck, etc.

For many years he formed a duo with the pianist Albert Lotto with whom he played in France, the United States, Canada, Japan and China. At the same time, he is a professor at the École Normale de Musique de Paris until 2020 and teaches in various academies and master classes, including the Iwamiginzan International Music Academy in Japan, of which he is one of the founding members.



Musician, bass clarinet (cast in progress)





Marc-Antoine Novel, cello

After training with Martine Bailly, Philippe Muller and Xavier Gagnepain, Marc-Antoine Novel studied with Anne Gastinel at the CNSMD de Lyon, where he obtained his Master's degree in cello with honors. He has also taken part in numerous academies and master-classes with other renowned pedagogues, such as Léonid Gorokhov at the Académie Internationale d'été de Nice and Marc Coppey at the Académie Ravel. His taste for the orchestra has led him to play with renowned ensembles such as the Orchestre de Paris, with whom he has taken part in several sessions as an academician, and the Orchestre National de Lyon and the Orchestre Colonne, where he is regularly invited as an extra musician. He was also principal cellist of the Orchestre des Lauréats du Conservatoire from 2018 to 2021. He is currently principal cellist of the Orchestre de Chambre d'Ariège, alongside violinist Marie Cantagrill.

He is also interested in chamber music, which he performs as a duo with pianist Philippe Hattat at numerous festivals, and also as a piano-violin-cello trio in a wide variety of settings: Synagogue Copernic, Salle Cortot, where on February 6, 2020, alongside violinist Iris Scialom and pianist Baptiste Tricot, he premiered his trio L'Évadé on a poem by Boris Vian (commissioned by the Paris Chamber Music Center), Accademia Chigiana in Siena, etc.

A curious and eclectic musician, Marc-Antoine is equally attracted to the more theoretical aspects of music. This led him to study composition, a discipline for which he holds a Master's degree from the CNSMD in Paris. He also studied conducting with George Pehlivanian at the CNSMD, and with Adrian McDonnel at the Schola Cantorum de Paris. He regularly conducts the Orchestre de Chambre Quartier Latin, which he founded in 2016.

Holder of the "Certificat d'Aptitude" as cello teacher, he has been teaching this discipline at the Conservatoire de Saint-Germain-en-Laye since September 2022.



THE UNIVERSE IN A DROP OF WATER

Microplankton contained in a drop of water
photographed by electron microscope





Kazuko Narita, composer

studied at CNSMD from Paris from 1976 to 1985 and won first prizes for harmony, fugue, counterpoint, orchestration and instrumentation and musical composition and second prize for electro-acoustic musical composition.

Among the many accolades she has received are prizes won at the Xenakis International Composition Competition, the Max Deutsch International Composition Competition, the Kanagawa Choral Music Composition Competition, and the International Electroacoustic Music and Sound Art Competition. de Bourges, the Takei Prize, and the Japanese Ministry of Culture Prize for scenic creation.

His catalog includes the chamber opera Yume composed for Polychronies, numerous pieces of chamber music, several pieces for orchestra, compositions for choir and instruments as well as several concertos including one for koto Keishô, one for accordion Paysage in B flat created by Pascal Contet, one for alto Song of distant hope op.54 created by Gérard Caussé, one for clarinet Aria created by Michel Lethiec and numerous electroacoustic pieces.

She is a professor of composition at Doshisha Women College in Kyoto.



Gérard Assayag, research director at Ircam

Gérard Assayag founded and directs the Ircam Musical Representations team in the STMS laboratory (Sciences and technologies of music and sound). He directed this laboratory from 2011 to 2017, and in this capacity, was involved in national and international research policies in music and sound sciences. Gérard Assayag has contributed to the creation of several major institutions such as the Collegium Musicae and the Institute of Artificial Intelligence at Sorbonne University or the Society for Mathematics and Computation in Music.

He has defined and popularized, through his numerous publications and software creations (openmusic, max, somax), the concepts of symbolic interaction and co-creativity, in order to account for a rich and versatile human/machine musical dialogue, prefiguring future generations of creative AI. He is the recipient of the prestigious ERC advanced grant from the european research council for his REACH (Raising co-creativity in cyber-human Musicianship) project which supports numerous research and creation activities in 2021-2025.

Lara Morciano, composer

Lara Morciano, a pianist who graduated from the Tito Schipa Conservatory in Lecce at the age of 16, then from the «Academie Pianistique d'Imola» in advanced studies (classes of Rodolfo Caporali, Aldo Ciccolini and Franco Scala), studied composition at the same time at the Conservatoire Sainte Cécile in Rome with Franco Donatoni, where she obtained the advanced diploma in composition in 1995. In 2001, she was selected by the Ensemble intercontemporain (EIC) and Ircam to participate in the composition and computer music course at Ircam. In 2002, she obtained the composition diploma with honors at the Conservatoire National de Région de Strasbourg (class of Ivan Fedele). In 2012, she won the Prix Giga-Hertz international composition competition in Germany for Raggi di stringhe (2011), for violin and electronics, commissioned by Ircam. This was followed by a commission from the Musica Festival in 2013 for Intextus for baroque instrument ensemble and dance, on a choreography by Christine Bayle. The same year, she was selected for the SACRe (Sciences, Arts, Creation and Research) doctoral program at the Université Paris Sciences et Lettres, in partnership with the École Normale Supérieure, the Conservatoire National Supérieur de Musique et Danse de Paris and in collaboration with Ircam, where she defended her PhD in composition in 2018 under the supervision of Gérard Assayag. Estremo d'ombra (2015), commissioned by Ircam and the Venice Biennale, was created in Venice in October 2015 and as part of the Festival Présences de Radio France in 2016. At the International Computer Music Conference in New York, it won the "Icma Audience Award for Best Music Presentation" in 2019.

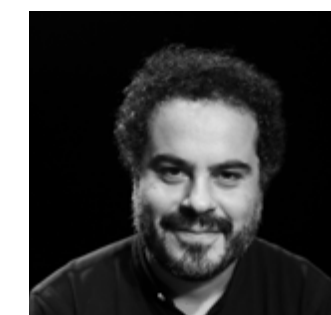


José Miguel Fernandez, computer music producer

José Miguel Fernández studied music and composition at the University of Chile and computer science at the LIPM in Buenos Aires. He then studied composition at the CNSMD in Lyon and followed the Composition Cursus at Ircam.

His works have been premiered at contemporary music festivals in North and South America, Europe, Oceania and Asia by French and foreign soloists and ensembles.

He was selected for the Bourges International Electroacoustic Music Competition and was a laureate of the Grame-Eoc international composition competitions in Lyon and the Giga Hertz Award in Germany. In 2014 he was selected by Ircam to follow the composer-in-residence program on interaction in mixed music and in 2018 for a residency in partnership with the SAT in Montreal. In 2021 he defended his doctoral thesis in music (research in composition) at Sorbonne University/Ircam and he is currently continuing his post-doctoral work within the RepMus team at Ircam as part of the REACH project. His research project focuses on the writing of electronics and the exploration of new tools for the creation of mixed and electroacoustic music.





Jacques Keriguy, author

Jacques Keriguy, former director of the National School of Libraries and Information Sciences (ENSSIB) is the author of novels and poetic works, often combined with musical notes, in which he seeks to share the irresistible enchantment that emanates from Japan. Assigned in 1995 to the “Maison franco-japonaise” in Tokyo, he became interested, through the testimonies they left, in the work of the Portuguese Jesuits who arrived in Japan in the 16th century. He drew from them the material for novels published by Éditions du Seuil, *La Jonque cathédrale* (2000) and *L'Agonie* (2003). Also passionate about classical Japanese theater, he undertook to explore its spiritual and religious representations to make its meaning accessible to the Western public. Jacques Keriguy is honorary president of the Académie du Var and president of Polychronies/2cdm. At the multilingual Anima Viva publishing house, he directed the Golden Nihon collection, with the aim of taking a look at the spiritual, social, artistic and cultural roots of Japan.

Website: www.jacqueskeriguy.com



Mark Blezinger, multimedia director

Born in Baden-Baden and living in Paris, multidisciplinary artist, Mark Blezinger, travels between photography, theater and filmmaking (arte, European television, museums). As a theater man, he collaborated at the Schaubühne in Berlin with directors such as Klaus-Michael Grüber, Peter Stein, Luc Bondy but also with Patrice Chéreau or Bob Wilson in many French and European national stages.

Always curious about new technologies, his priority today is the creation of visual and imaginary worlds that bring together Art and Science: (lenticular) photographs taken for the Army Museum, the Mines Foundation or collectors and exhibited at the Rencontres de la Photographie d'Arles or at the ZKM; traveling multimedia exhibitions such as *Laterna Magica. The Art of Projection*, created at the Cultural Archives of the Upper Engadine, passing through the Rhaetian Museum in Switzerland and then installed at the Théâtre de la Ville in Paris; sound and light shows for the Parc Ela or the “Musée des Merveilles” featuring the work of the painter Giovanni Segantini, the “Belle Époque” or the “Alpine Herbiers”. Also a director for live shows, he creates multimedia scenographies for opera or theater, more recently integrating digital technologies such as interactive projections, generative AI and XR, as during the inaugural concert of the ITN at Salle Cortot in December 2023.

He is the artistic director of Béla Compagnie, which has been producing his works since 1995.

Website: www.blezinger.com

Actor (actrice) (cast in progress)





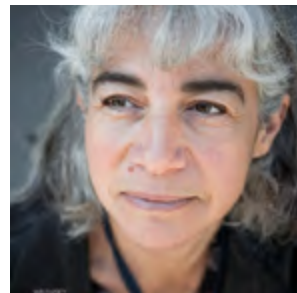
Scientific team



Brigitte d'Andréa-Novel, professor at Mines Paris, director of the ITN.



Philippe Blanc, research director at the O.I.E. Center (Observations – Impacts – Energy), head of the “Energy and processes department” at Mines Paris.



Sandrine Mathieu-Blanc, deputy director of the Space Science and Earth Observation department “Acri-St Observation of the Earth and the Universe and data management”.



Hervé Glotin, scientific manager of bio-acoustics, LIS laboratory (computer science and systems laboratory) for the acoustic and ecological study of the seabed, professor at the University of Toulon, specialist in underwater bioacoustics (particularly cetaceans) and also in deep learning.



Claire Dune, researcher in underwater robotics at the Cosmer laboratory (design of mechanical and robotic systems).



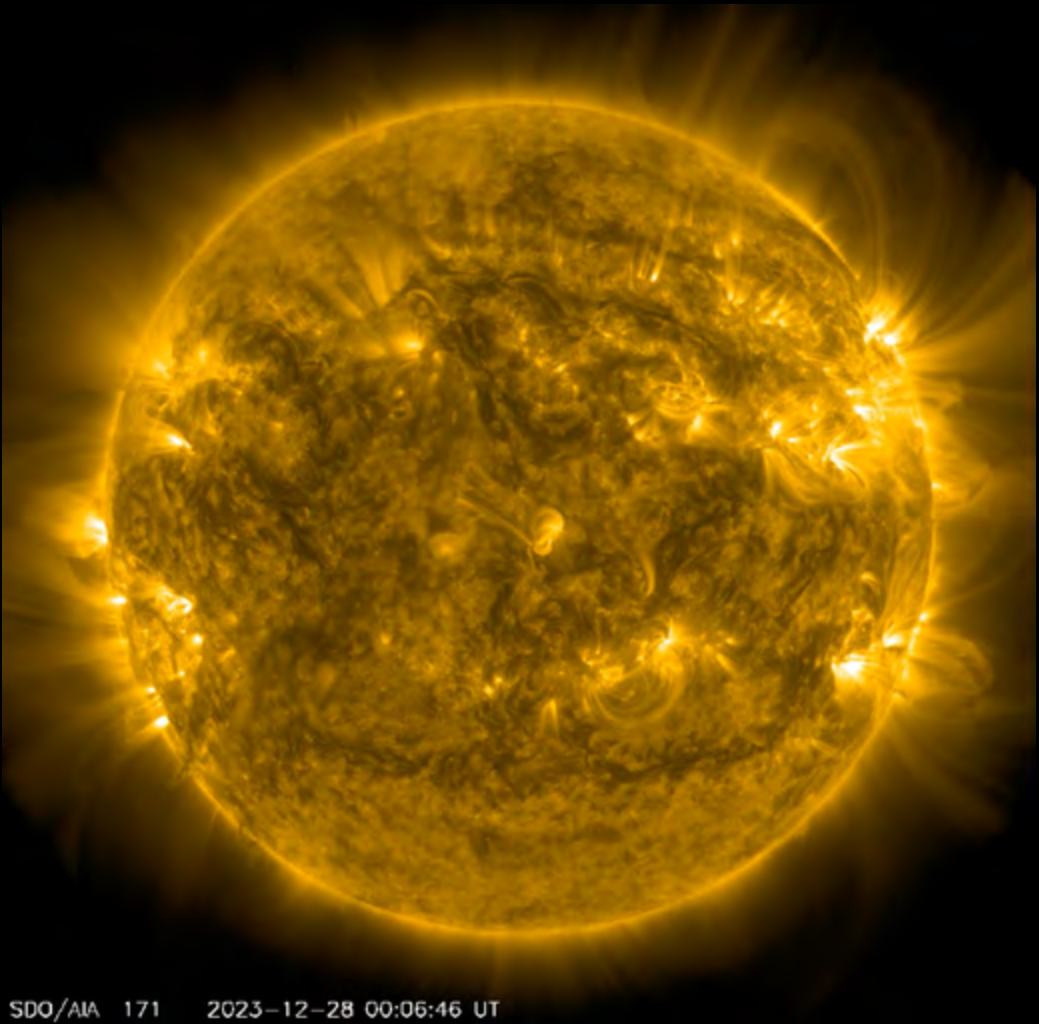
Valérie Michel-Fauré, researcher in the history of contemporary art and professor at Esad TPM (Higher school of art and design - Toulon Provence Méditerranée) and at the Camondo school in Toulon.



Vincent Rigaud, director of the Ifremer Center of the Mediterranean.



Guy Herrouin, honorary director of the Ifremer Center of the Mediterranean.



Graphic design and production ©Mark Blezinger, 2024

Contact

Co-production

Mines Paris – ITN (Institute of Digital Transformations) - Executive producer
Crescendo-Apjm (Association for the promotion of young musicians)
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