

Un Film à la Patte, Panoramique Terre Productions,  
Càbala Producciones, Exocet 9

present

# IN SEARCH OF THE AURORA “THE TITANIC OF TITICACA”

A film by  
**FRÉDÉRIC CORDIER**  
Written with  
**PHILIPPE MOLINS**

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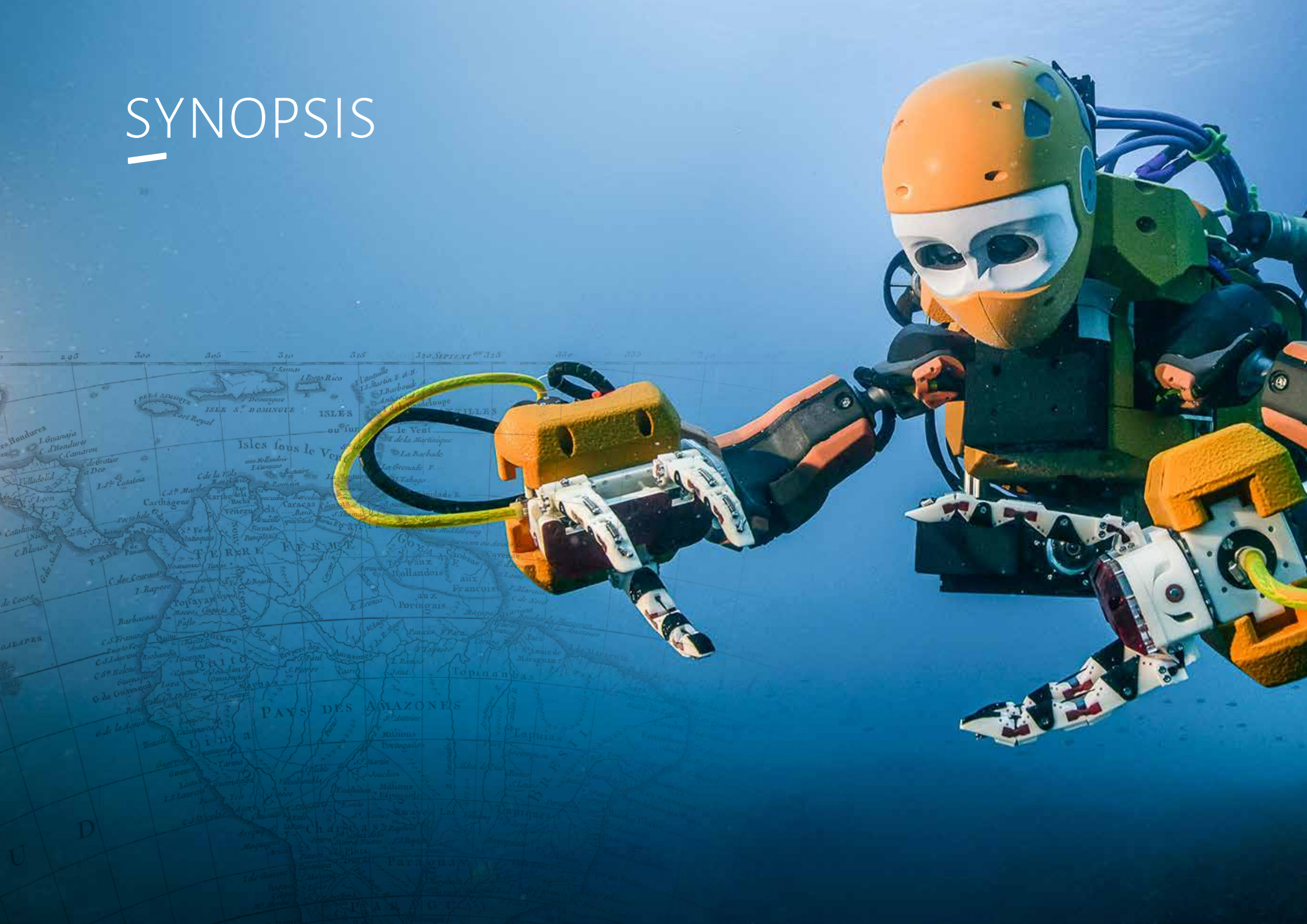
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# LOGLINE

On the sacred lake of **Titicaca** in Peru situated at an altitude of 4,000 meters, an international scientific team is searching for the first time the depths of the lake for the wreck of a mysterious English steamer, the **Aurora**. This is an extraordinary expedition aboard a 19<sup>th</sup>-century gunboat equipped with a humanoid robot called **Ocean One**.



# SYNOPSIS





In the middle of the 19th century, at the height of the “industrial revolution” which began in the United Kingdom, the first steamers were being built. At that time, politicians and traders from all over Europe were eager to negotiate diplomatic alliances and trading partnerships with the countries of Latin America which they saw as a new El Dorado.

Several steamships were dismantled before being sent on a long and hellish journey from England to be transported over the Andes mountains in parts on the backs of mules all the way to Peru. One of these ships, which was built in Glasgow, was the first ferry to sail on the world’s highest lake, Titicaca, at an altitude of nearly 4,000 meters. It was given the name of **Aurora del Titicaca**.

But the iron-hulled schooner soon sank to the depths of the lake and on the high Andean plateau the reasons for the shipwreck remain a mystery.

One hundred and fifty years later, an international scientific expedition embarks on a 19th century gunboat with a unique humanoid robot **to search for the Aurora and investigate the story of the dramatic shipwreck.**

“In search of the Aurora, the Titanic of Titicaca” is a documentary of exploration, adventure, and scientific and historical investigation. It is a modern odyssey that takes us to the heart of the mysteries and challenges of navigation on this legendary lake and tells an unknown story. **This unprecedented scientific expedition will allow us to explore the shadowy depths of this vast high-altitude lake for the first time.**







In the magical setting of Titicaca and the Andes Mountains, we will tell the story of the fantastic adventure of these men who crossed seas and mountains to carry a ship to an altitude of nearly 4,000 meters. It is an adventure reminiscent of the epic story portrayed in Werner Herzog's film "Fitzcarraldo" about a Spanish caravel that was transported through the Amazon forest.

We will re-enact parts of this epic story and mount an expedition using the latest technology. Searching for a wreck in a high-altitude lake at a depth of nearly 300 meters remains a significantly risky affair. It requires physical skill, scientific knowledge and advanced technology especially adapted to the circumstances. Such an expedition also represents a challenge for the making of the film. We will use the only restored antique steamer still navigating on the lake, the **Yavari, Aurora's sister ship, as the expedition vessel** which will also carry **the humanoid robot Ocean one** and its team from Stanford University. Our story is centered on the investigation of the shipwreck and will feature a cast of characters each with their different stories but who are all seeking to solve the mystery of the sinking of the Aurora of Titicaca and discover the scientific mysteries of the unexplored depths of the lake.

By means of spectacular images shot on land, underwater and from the air, this ambitious documentary adopts a fictional approach in which an epic, upbeat and romantic narrative line seeks to reflect the bold spirit of the adventurers of the period. Combined with the authentic accounts of naturalists of the time we will present the investigation and research findings of **Laurent Masselin**, the expedition leader. Stories from the past and present-day adventures will merge into a single narrative line to reveal to the viewer a picture of the Aurora lying in the impenetrable depths of Lake Titicaca.

We will also film highly evocative natural scenery as well as a foundry from the period, the London docks and mountain paths in the Andes mountain range. Archive documents with photos, drawings, engravings, and 3D digital animations as well as evocative re-enacted scenes will illustrate the various commentaries and analyses.



An underwater scene with a teal color cast. In the center, a diver's gear is visible, including a large black air tank with blue hoses and a pair of black fins. A large, dense plume of white air bubbles rises from the tank towards the top right. The background is dark and murky, suggesting an underwater environment. The text 'A UNIQUE EXPEDITION' is overlaid in the bottom left corner in white, with a small white horizontal line below the word 'EXPEDITION'.

A UNIQUE  
EXPEDITION





**Laurent Masselin**, a French cartographer, speleologist and diver is accompanied by **Roció Villar**, one of the few Peruvian archaeologists who regularly dives in Lake Titicaca, as well as other international scientists specialized in different fields, such as **Xavier Lazzaro**, a marine biologist who studies aquatic ecosystems. For the first time they will be able to explore the depths of Lake Titicaca on the Peruvian side of the border and may discover unknown endemic species.

Their main goal is to look for the Aurora del Titicaca, a steamer built in Glasgow in 1855, dismantled in London and loaded on a cargo ship that sailed around Cape Horn and up the Pacific coast.

Unloaded in parts in a makeshift harbor on the arid Peruvian coast, the steamer was transported over the Andes mountains on the backs of mules and hastily re-assembled on the shores of the lake.

This steamer schooner sailed the waters of the Titicaca until 1876. On its way back to Puno, with many passengers on board, including celebrities of the period, scientists, writers, journalists and businessmen, the Aurora hit a reef and sank into the depths of the lake's waters.

Was the wreck due to a structural defect? to a navigation error? Did the captain obstinately seek to adopt a different course because of bad weather? Navigation can be very dangerous on this seemingly calm lake. Aymaran navigators speak of torrential storms with whirlpools that can form on the surface and suck all objects to the bottom of the lake. There was no map of the lake at the time and we know that Geronimo Costa, the captain of the Aurora, had sailed only a few times on the lake and lacked experience.

There are no written records of the shipwreck, no death certificates or log entries, yet local villagers have reported findings until recently of scraps of metal off the coast of the island of Amantani. Some fishermen have even reported taking metal objects out of their nets.

At the end of the 60s, Captain Cousteau is said to have spotted a wreck in a submarine trench off the coast of the island of Amantani, although he didn't identify it as the Aurora. Then in 2002, a team from the Peruvian Navy found pieces of a wreck which included part of a ladder at a depth of more than 30 meters off the same island. The trench which is more than 100 meters deep makes it impossible for divers equipped with simple air tanks to search its depths for the wreck. This has so far made it impossible to take photos of the wreck or bring any objects to the surface. There are only three Peruvian press articles which recorded the event at the time and a later naval report refers to the presence of steel fragments at the bottom of the lake.

Could the wreck of the Aurora be more than just a legend?

Laurent Masselin started preparing the expedition with the support of scientists, including specialists on the sediments of the lake, which due to its high altitude greatly complicates diving operations and modifies the whole diving experience. Titicaca is a freshwater lake, and as a result the absence of salt ensures there is a real chance of finding shipwrecks in good condition. If the possibility of finding any wrecks of pre-Columbian wooden or reed vessels is almost nil, there is a distinct possibility of being able to find the wreck of a steel-hulled boat.

# A HUGE, LEGENDARY SACRED LAKE AND AN ECONOMIC EL DORADO

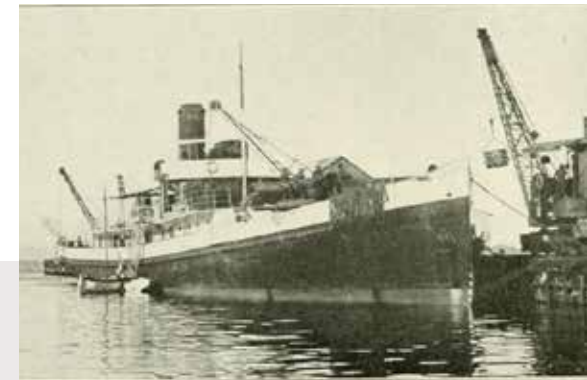


A huge inland sea perched at an altitude of more than 3800 meters and covering nearly 9,000 km<sup>2</sup>, covering parts of Bolivia and Peru and surrounded by the Andes Mountain Range, Titicaca is a legendary sacred lake for the Aymara, the people of the highlands who still worship it today. The Uru or Aymara Indians, who still sometimes navigate on the lake in their balsa canoes, all speak of Titicaca as a lake that has moved, risen and fallen over the years. In the 1980s, after a major drought, the water level dropped considerably. Some even say they have seen wrecks emerge from the waters. It is a fact that the lake lives and breathes, thus generating rumors and inspiring legends of all kinds.

Laurent has already mapped out some parts of Titicaca. He knows that there is some truth in these beliefs because the region is subject to tectonic movements. One of his theories shows that current and sudden variations in the water level could be due to tectonic plate movements in the depths of the lake (there are many earthquakes in the region) which could induce an outflow of water and thus sometimes lower its level. Some Aboriginal navigators even report having seen whirlpools form on the surface which would drag any object to the bottom of the lake.

Titicaca has always been a navigable lake prized by pre-Columbian populations, who considered this inland sea as a sacred place where fish were abundant, and later by the Spanish, who thought that the Incas had hidden tons of gold in its depths. Then in the 19th century, an unprecedented demographic explosion, the need to escape poverty and the promise of virgin land attracted settlers who conquered South America. Encouraged by the newly independent states of Bolivia and Peru, the successive waves of migrants crossing over from Europe to the Americas intensified. Major European countries such as France and Britain saw this as a political and economic priority. The competition between European countries and companies for these new markets was particularly fierce in Peru and Bolivia, two countries very rich in mining resources such as gold, silver, tin, iron, copper, and sulfur. It was decided that if all these resources could be transported to the lake and then by river to the port of Puno, it would be possible - via a mule track - to bring these goods to the Pacific ports and thus copper, gold and tin could be exported to Europe and the United States. The stakes were high, and the lake was soon considered as a key strategic asset.

It was in such a context that the incredible sagas of these steamers and of the Aurora were born.





# THE YAVARI, AURORA'S SISTER SHIP





There are many stories that have been written and told about the steamboats that followed the Aurora of Lake Titicaca. A total of seven ships were launched during the second half of the 19th century.

One of them, the Yavari, was saved from being scrapped by an Englishwoman, **Meriel Larken**, who knows everything about the history of navigation on Lake Titicaca. As the sister ship of the Aurora, the Yavari is an inspiration in our research on the Aurora.

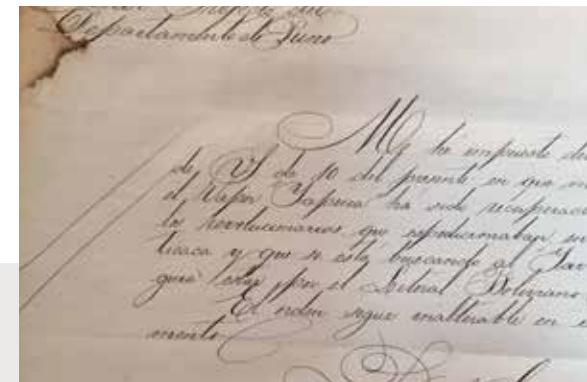
In 1861, Peruvian President Marshal Ramón Castilla ordered the construction of this 49-metre-long steam gunboat christened the Yavari for Lake Titicaca. It had to be made of riveted steel and it had to be possible to dismantle it. In 1862, Boulton and Watt in Birmingham were commissioned to build the Yavari.

More than ten years were needed between the beginning of the construction of the Yavari and its maiden voyage on the lake. More than three times longer than initially planned. Nearly a thousand Indians and hundreds of mules were requisitioned for the crossing of the Andes Cordillera to transport the Yavari in parts to the lake before it was assembled.

This ill-fated project was plagued from the outset because of the impracticability of the route, the hellish climatic conditions in the mountains, earthquakes, declarations of war, Indian rebellions, epidemics, and drownings.

Chief Engineer **William Partridge** was the central character in this adventure. Present at the construction of the boat at the London docks, he stuck it out and fulfilled his mission which ended with an interminable wait in Puno, Peru. He waited for years in the hope of receiving the parts of the ship in order to finish its construction.

Many years later, it was Meriel Larken who literally fell in love with this steamer which had been abandoned in 1972 and left to rust away in the port of Puno. This enterprising Englishwoman spent years of hard work and relentless research to completely restore the ship. She is in possession of most of the archives on the ship. Now retired in her country home in Wiltshire, Meriel Larken is Laurent's principal ally and a source of invaluable knowledge for his investigation. Surrounded by old maps and maritime objects in her cozy British country cottage, Meriel is an outstanding storyteller and a keen historian of navigation on Lake Titicaca. She regales us with fascinating accounts in which she meticulously evokes the details of the crossing of the Andes of the ship's parts on the backs of hundreds of mules and more than a thousand porters. She also precisely recalls the countless parts needed to reassemble the first steel-hulled ships on the lake which lies three hundred kilometers beyond the lofty Andean peaks.



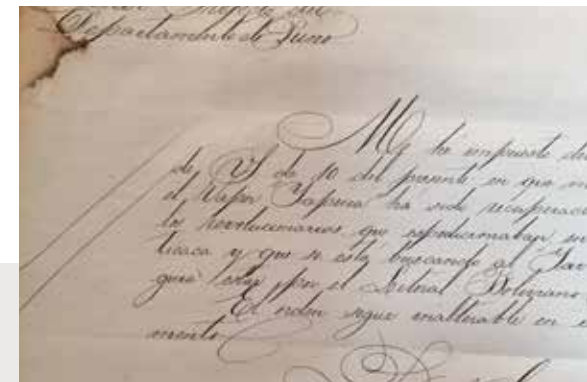
An underwater scene featuring two divers. One diver, wearing a bright orange BCD, is on the left. The other diver, wearing a grey BCD, is on the right and is writing in a white spiral notebook with a black pen. The water is greenish and contains some seaweed. A scale bar with numbers 1 through 6 is visible at the top left.

THE AURORA INVESTIGATION,  
BETWEEN PERU AND BOLIVIA...



First stop: Puno in Peru. A port city facing the lake which is a vast inland sea. The harbor has not changed since the 1850s. The pier remains small and is lined with old buildings painted a faded red which look just like those in the few black and white photos Laurent has at his disposal and which miraculously survived a fire that destroyed the regional archives. A railway line connects the old station of this colonial city to the harbor. A restored train, pulled by its locomotive and belching smoke like in the old days, literally pushes aside the Aymara cholitas who have come to sell their empanadas and alpaca fabrics. The clanging wooden-framed wagons stop very close to the Yavari, a hundred-year-old ship, the last vestige of the steel revolution. It is quite easy for Laurent to imagine these same places as early as 1874, when the Puno train line to Arequipa was first opened. This railway line, which is almost 300 kilometers long, goes from the lake to the Pacific coast and was strategically very important. It made it possible to quickly transport goods and people from the remote heartlands to the different Pacific ports. It is highly likely that the Aurora del Titicaca ferried passengers and cargo from all over the Altiplano after its heroic crossing of the Andes.

There are documents which give the identity of the captain of the Aurora and some of the crew members who survived the shipwreck. It is thought that among the victims was the American explorer **James Orton**, who was one of the geographers and naturalists who discovered the Amazon basin and the west coasts of South America with Humboldt. Laurent has been told that a memorial was erected on the scientist's grave on an island facing Puno. A visit to the island is planned and will be an opportunity to gather more valuable information from local villagers.



THE YAVARI  
EXPEDITION VESSEL







Today, the Yavari has become a living reminder of these historical challenges. Its captain, **Màximo Flores**, a swarthy Peruvian in his fifties, has completely overhauled the ship's engine and is the only one today who knows how to operate it.

Capable of sailing at nearly 11 knots, day or night, the modernly equipped Yavari is an ideal expeditionary vessel, a bit like Cousteau's legendary Calypso.

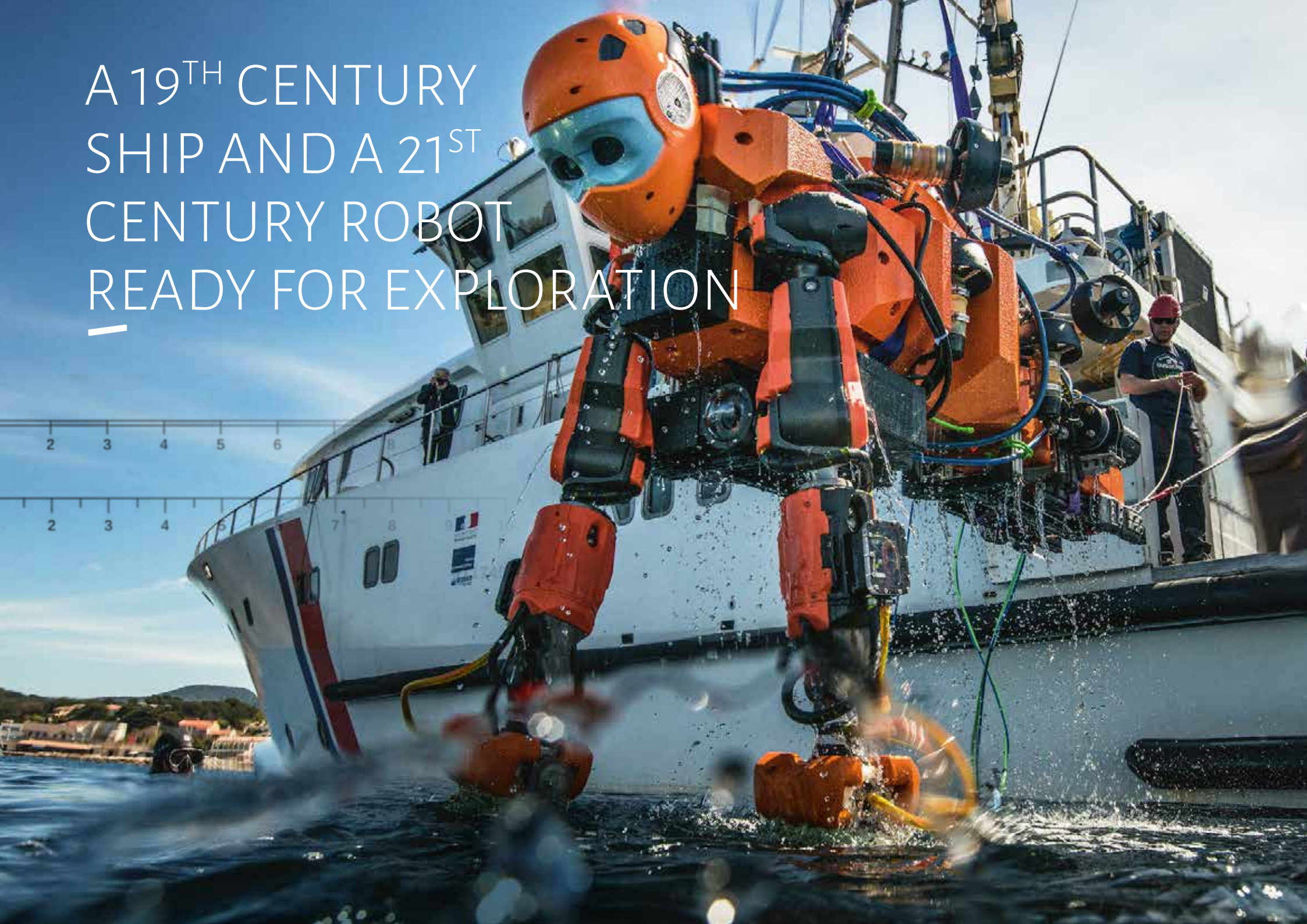
The ship, which was built from the same plans as the Aurora del Titicaca, is a jewel of a vessel with its precious wood and copper fittings. She is 150 years old and is in perfect condition! The original steel plates of her hull are in very good condition. Her doors are in varnished wood, the chandeliers are made of bronze and the compass casing and rudder of mahogany. She still has her original telegraph mast and capstan and all the beautiful hardware is perfectly maintained.

The captain's elegant massive cherrywood table in the saloon, originally imported from England, is ready to greet the captain's guests for dinner.



A 19<sup>TH</sup> CENTURY  
SHIP AND A 21<sup>ST</sup>  
CENTURY ROBOT  
READY FOR EXPLORATION

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To conduct the expedition aboard the Yavari, Laurent must adapt the deck to accommodate the equipment and the needs of his divers. He must add berths for his team and set up a small room to house the computer screens which will make it possible to view, in real time, underwater and aerial images taken by the robot and a drone. On the aft deck, a wooden lifting system consisting of pulleys and hoists with a lifting capacity of over 800 kilos can be used to launch a bathyscaphe and Ocean One, the robot Laurent intends to use.

**Ocean One** is a 250-kilogram humanoid robot capable of diving to depths humans cannot withstand.

This robot will make it possible to safely explore every nook and cranny of the wreck.

Built at Stanford, the famous American university, this fabulous invention is the brainchild of **Oussama Khatib**, a professor in systems engineering and mathematics.

This 21<sup>st</sup> century robot will dive from the 19th century boat. It is an unprecedented event.





# A 21<sup>ST</sup> CENTURY EXPEDITION



The adventure will transition from assumptions to postulates and from suppositions to certainties as the Yavari casts off in search of the Aurora.

During the expedition, Gustavo Villaviciencio, the chief diver of the Peruvian Navy, who has reportedly identified the location of the wreck of the Aurora, will join the expeditionary vessel to help Laurent and Rocio locate the famous trench where the schooner is believed to lie. From that moment on it is the expertise of the scientists specialized in the analysis of sediments that will be essential in preparing for the exploratory dives.

Lastly, Laurent will bring Meriel, the godmother of the Yavari to Peru. Together, on the restored steamer, they will reconstruct the last days before the shipwreck of the Aurora to try to understand the causes of the tragedy. On the Yavari everything is the same as on the Aurora. The sailors' uniforms, the sounds of the steamboat as its bow cuts through the cold waters of the lake, the captain's orders barked over the intercom in the engine room and the rattling of the railings on the wooden deck, all these details will help create an atmosphere of adventure. It is easy to imagine Meriel's feelings as she relives this journey. Her boat is still in service, but the Aurora suffered a different fate.

The story will unfold as if it were being played from a music score and we will live through, minute by minute, the adventure of the discovery of the wreck. The humanoid robot Ocean One will slowly descend into the dark waters of the lake and glide among the wreck of the submerged hull of the Aurora wrapped in a cloud of floating particles of sediment...

**Trailer : <https://vimeo.com/359476724>**





THE MAIN  
CHARACTERS

### **LAURENT MASSELIN [1]**

A cartographer, speleologist, diver and the founder of EXPLOGEO, an association specialized in research expeditions in places which are difficult to access, he is the expedition leader. This tall, energetic, athletic man with piercing blue eyes will be our guide.

### **ROCIÓ VILLAR ASTIGUETA [2]**

A Peruvian archaeologist and PhD student at the University of Paris 1 Sorbonne. She is working with the Peruvian Ministry of Culture on Peru's cultural heritage in search of a pre-Hispanic maritime trade route. She is one of the few archaeologists who regularly dives in Lake Titicaca.

### **JOSE ERNESTO DE LA JARA**

A historian and former captain of the Peruvian Navy. He is the author of the only book on the history of navigation on Lake Titicaca, "La Flota del Titicaca".

### **XAVIER LAZZARO [3]**

A researcher in biology from the French Institute for Research in Development (in French, Institut de Recherche pour le Développement, IRD), he has been living in Peru for 30 years and is a coordinator of the Lake Titicaca bi-national observatory, specializing in marine organisms and ecosystems.

### **MERIEL LARKEN [4]**

The Englishwoman and adventuress who rescued the Yavari, the sister ship of the Aurora. She is in possession of unpublished documents relating to major events of the period. The restoration of the Yavari has been the great adventure of her life.

### **MAXIMO FLORES [5]**

He is the Peruvian captain of the Yavari and the only person, apart from his wife Antonia, able to sail her. Maximo is a living repository of the history of navigation on Lake Titicaca. He knows all the secrets of the lake.

### **OUSSAMA KHATIB [6]**

A Professor in Systems Engineering and a Mathematician from Stanford University. He is a dedicated researcher and the inventor of the humanoid robot Ocean One, which he is constantly perfecting.

### **VINCENT CREUZE**

A researcher in robotics at a Laboratory of Information Technology, Robotics and Microelectronics (in French, LIRRM, Laboratoire d'Informatique, de Robotique et de Microélectronique) affiliated to the University of Montpellier and the CNRS in France. He is a specialist in underwater robotics and accompanies Ocean One on its expeditions.

[1]



[2]



[3]



[4]



[5]



[6]



LAGO CATALOGO

# TITICACA

PLANO FORMADO SOBRE  
LOS TRABAJOS DE  
PENTLAND, RAIMONDI, ACASSIZ, /

*Para la Conferencia que en la noche del 21 de Diciembre del año  
de 1888, dió en el local de la Sociedad Geográfica, el Sr. Dr.  
Ignacio La Puente, sobre el estado topográfico del Lago, bajo  
un aspecto físico e histórico.*

*Por*

*RAFAEL E. BALUARTE*

*ENTENIDO DE LA SOCIEDAD GEOGRAFICA DE CHILE.*

*COLABORADA Y DIBUJANTE DEL MAPA OFICIAL DEL PERU DEL PROFESOR DON A. HUMBOLDT.*

1885

# THE AUTHORS AND THE DIRECTOR OF THE FILM





**Frédéric Cordier** is a Belgian author, director and producer, and the managing director of the production company Panoramique Terre production. He has travelled widely and is experienced in the techniques of underwater and submarine photography. He also has extensive knowledge of Latin America. In 2016 he directed the documentary “**The hidden secrets of lake Titicaca**” with RTBF and the Belgian Agency for Development and Cooperation which was also broadcast by France Télévisions and many other national television broadcasters.

**Philippe Molins** is a French author, director and producer.

A trained ethnologist, in the 1980s he took part in several expeditions in the Bolivian and Peruvian Amazon regions. He has directed more than 50 documentaries distributed internationally and produced many magazines such as «C'est pas sorcier», a scientific magazine broadcast by France 3. He is now living in Ecuador and devotes his time to scriptwriting. He also manages the Los Yaltes primary forest nature reserve where he hosts visiting scientists.



SCIENTIFIC  
PARTNERS  
—



## IRD

The French Research Institute for Development (in French, Institut de Recherche pour le Développement) is a French public institution committed to research and knowledge sharing which provides expertise and training for the benefit of regions and countries seeking to use science and innovation as one of the principle drivers of development.

<https://www.ird.fr/>



## STANFORD UNIVERSITY

Stanford is a privately-run university dedicated to teaching engineering, medicine, law, commerce, as well as life, energy and environmental sciences. It is at Stanford University that the ongoing development of the humanoid robot Ocean One is being conducted by its inventor, Professor Oussama Khatib.

<https://www.stanford.edu/research/>



## LIRRM

The French Laboratory of Information Technology, Robotics and Microelectronics based in Montpellier (in French, Laboratoire d'Informatique, de Robotique et de Microélectronique de Montpellier).

<http://www.lirmm.fr/>



## DRASSM

The Centre of Underwater and Submarine Archaeological Research (in French, Département des Recherches Archéologiques Subaquatiques et Sous-Marines) is a department of the French Ministry of Culture and is based in Marseille. Directed since 2006 by Michel L'Hour, a professor of archaeology, national heritage curator and experienced diver, the DRASSM develops robotics for archaeology.

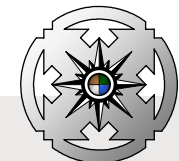
<http://archeologie.culture.fr/fr/drassm>



## EXPLOGEO

Explogeo, an organization founded by Laurent Masselin, sets up research and exploration programs and has distinguished itself for its ability to adapt to all types of field research contexts. Its mission is to provide technical and scientific expertise for projects for the study and preservation of cultural and natural heritage sites.

<http://www.explogeo.org/>



# THE PRODUCERS AND MEDIA PARTNERS

**UN FILM À LA PATTE** was created in 2013 in Strasbourg by two experienced producers, Ariane Le Couteur and Agnès Trintzius, and a third producer joined the team, Laure Bernard. We produce mainly documentary films or series in the fields of human adventure, arts and culture, discovery, science, archaeology, social issues as well as history and geopolitics. Our productions clearly reveal the high level of quality we aspired to. We work in close collaboration with European broadcasters such as ARTE and France Télévisions as well as international producers and distributors.

<http://www.unfilmalapatte.fr/>

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**PANORAMIQUE TERRE PRODUCTIONS** is a production company based in Brussels created in 2015 by Frédéric Cordier. The company produced documentaries about exploration, science, adventure and history.

In 2015 PTP produced with RTBF a 52' film about an archeologic expedition in the Titicaca lake in Bolivia "The hidden secrets of lake Titicaca" distributed in 20 countries.

Since 2016, PTP coproduced several documentaries with Un Film à la Patte. n an historical and scientific one about the famous mummy Rascar Capac from Hergé album : « Tintin et les sept boules de cristal » with Arte and RTBF. The 90' and 52' one with France Televisions : "In search of the Aurora, the Titanic of Titicaca".

<https://www.panoramiqueterre.be/>

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