

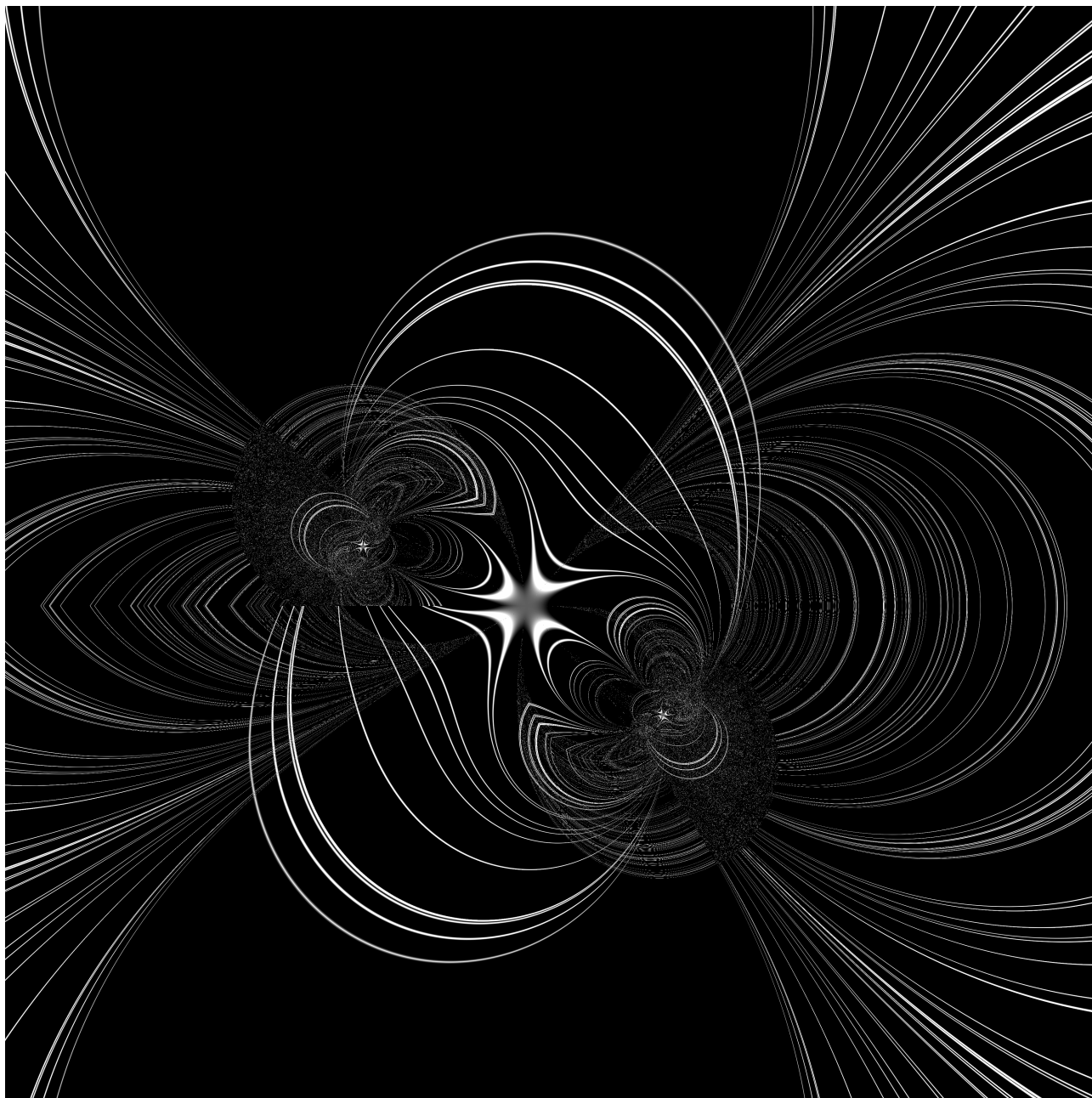
# IC (Interconnections)

**"LOOMS, FABRICS AND IMPLEMENTATION TO WEAVE TEXTILE SURFACES WITH ASTRONOMICAL DATA"**

The Project that begins in 2021  
Direction and Concepts Idea: María José Ríos A  
[www.triptico.vestibles.cl](http://www.triptico.vestibles.cl)

Artist  
Rigardo Vega  
Francesca Piñol  
施惟捷 Shih Wei Chieh  
Nicolás Briceño  
Gonzalo Aspee

顧問&講者 Consultant & talker  
松下 聡樹 Satoki Matsushita



## 展覽介紹

I\_C 計劃是由Maria Jose River 發起，由位於安第斯山脈上的智利天文台ALMA (The Atacama Large Millimeter/submillimeter Array) 協助贊助，由多位藝術家一起進行的一項跨國協作，目前參與者包括了台灣的施惟捷、智利的Maria Jose Ríos, Rigardo Vega，以及在巴賽隆拿的Francesca Piñol。這個計劃旨在由結合當代天文技術和文化天文學的角度來觀看在當代和傳統的天空，將現代天文資料視覺化於織品製造中來呈現印加文化中的暗星座文化。我們期待以「拼湊天空」做為本行動的開端，本次在台北的展覽是I\_C計劃的首站和國際協作的初步呈現，實體作品主要以施惟捷的作品為主，其他遠端參與者的部份將在計劃網站中呈現。

在拼湊天空的脈絡下，本次展覽的另一個支線，紀錄了施惟捷曾經在2018西藏另一個高地上進行的社區合作：「我自2018年8月至11月與來自泰國的氣候工程師Wiriar Rattanansuwan自願加入了這個[義工計劃](#)。計劃目標是在青海囊謙建設一座溫室模型，在冬季也能抵禦-20°C至-30°C的溫度。該站點的海拔高度約為3,700米；主要任務是為位於32°31'45.2"N 96°03'05.2"E的紮西格森學校收容的孤兒提供常年蔬菜。」施惟捷使用老窗和當地植物染製的太陽能玻璃構建了此趟旅行的紀錄裝置。

## Maria Jose Ríos

我們每個人目前都生活在各種數據和信息的循環中，這些是一種與文化和社會環境直接相關和連接的元素，成為對現實、方面進行圖像閱讀的過程和環境的一部分在這個項目中將從紡織品中處理的數據中涉及天文學的重要性及其與前哥倫布時期人民給予我們領土的藝術和文化的結合：安第斯文化和馬普切人，這就是 I\_C 項目如何以一種基本的方式提出從傳統文化中的文化價值藝術探索天文學與紡織技術之間的關係，以及從新的數字技術對天文數據的視覺化的探索和行動。在 ALMA Data Observatory 中開放，使用允許的工具和技術製成的織物（稍後解釋和描述）：從紡織品中視覺化並連接它們，這也為數據視覺化提供了新的可能性和支持，這將是基於對我們的歷史和文化身份的重要性，古老的織布機編織技術一直延續到今天，但採用了某些數字、模擬和現代機械。

織機是一種能夠創建信息支持、社交和日常功能的工具，對於計算的歷史（提花織機作為第一個二進制系統）和今天的機器很重要。該項目專注於祖先技術，創造性地探索它們，以更好地欣賞創造這種具有重大象徵和社會意義的工具的文化，這是我們領土文化認同的重要元素。

宇宙是在全球範圍內聯合和圍繞我們的大環境，產生了一個全球性和相互關聯的文化層，自地球上所有原住民的配置以來就發生了這種情況，這就是這個全球合作性質和地方性的項目如何使用來自紡織品的天文學和數據，這是對古代和全球信息傳輸的文化支持。這個線上串連合作包括智利、台灣（施惟捷），以及在巴賽隆那進行的編織工作，探索以紡織品作為數據顯示螢幕介面的可能性。該項目旨在通過其協作和全球性的工作方式產生連續性，並展望未來，其中還包括在人類學、藝術家、活動家、設計師和工程方面工作的跨學科人員群。電子和硬件。

施惟捷作為數據和連接天空的連接現實的參與或參與：

然後，該項目旨在通過數據（在這種情況下是天文數據、紡織品和新技術）產生全球或星際間的連接性，我們認為這些元素作為一個項目，重視全球連接網絡，能夠從歷史上亞洲和美洲用於紡織品的技術中可視化技術技術工作。

## I\_C x ALMA x Laser Dye

我們知道文化是不同的，但有一些東西將我們聯繫在一起：編織和紡織品作為一個文化網絡，將數據作為一種文化元素（對於這個項目來說是天文數字）。

施惟捷是我們認識的一位藝術家，他曾與（亞洲）祖先部落合作，除了與數據打交道外，他還與手工和數字技術有著非常完整的關係，並對提案非常感興趣。

因此，台灣也有ALMA的夥伴（松下 聰樹 Satoki Matsushita, ASIAA），施惟捷也從那裡找到了聯繫和幫助。

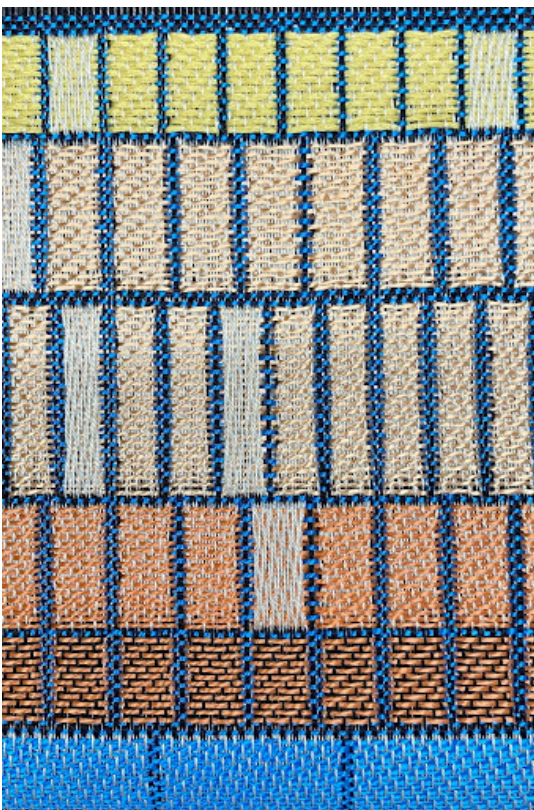
施惟捷的工作非常費力或對數據進行細緻的處理。來自智利的數據是以更一般和更簡單的方式得出的，而不是分析性的，是關於我們太陽系行星的化學成分和相同行星大小的數據，2 個編織表面正在生成挪威數字織機機器設備；來自巴塞羅那的 Francesca Piñol 正在執行這項編織工作，完成後將被帶到智利。

因此，該項目生成了這個執行和生產工作的全球網絡，顯示了連接和形成協作星座的能力。

在智利進行的另一部分是關於紡織品作為安第斯文化的天文信息傳播者的重要性的一般文件：艾馬拉、印加、帕拉卡斯等；還有馬普切文化，所有這些來自南美洲的文化。該書面和視頻文檔將在網站 [www.triptico.vesibles.cl](http://www.triptico.vesibles.cl) 的 I\_C 部分項目中在線提供，這不是詳細的調查，而是由兩位與這些文化有人類學和考古學密切關係的藝術家進行的，並將其應用於他最有創意的作品。

從考古學和人類學的角度來看，這是一個由藝術家而非該地區專家承擔的項目。

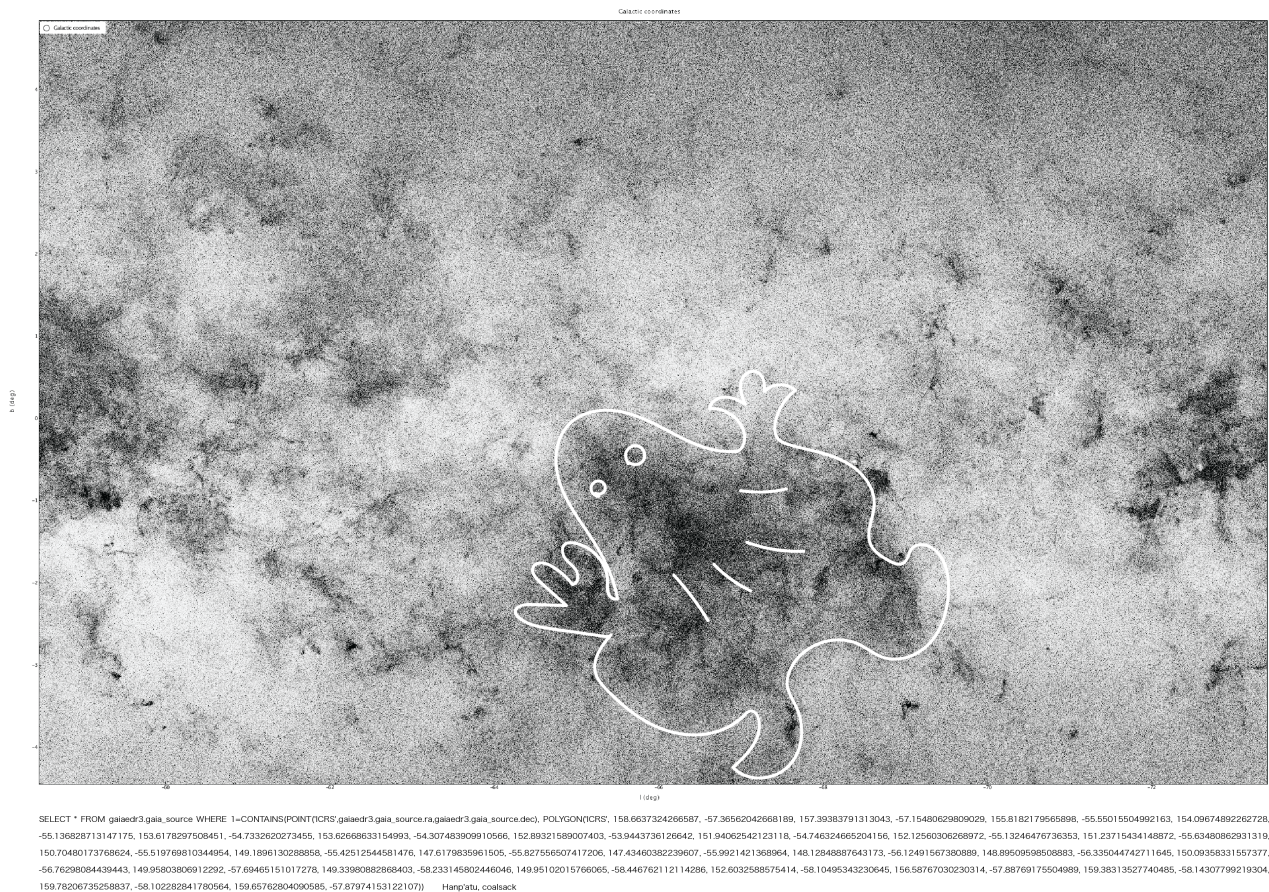
另一方面，正在製造數字機械織布機，以數字化處理圖像並編織它們：這部分是一種更具實驗性的體驗，因為這種織布機是以國內方式製造的，這將是開源的。



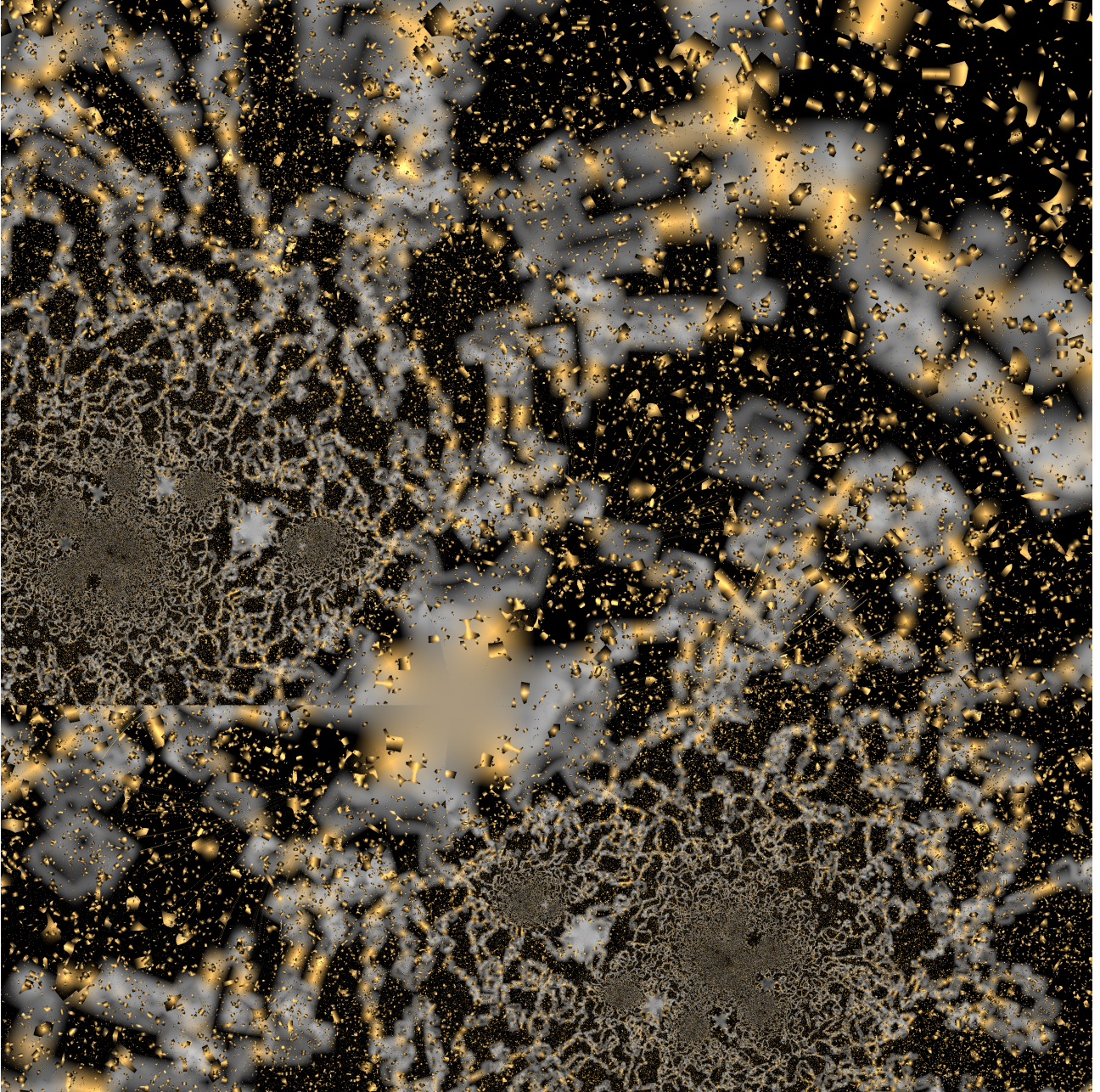
IMAGES PROVIDED BY MARÍA JOSÉ RÍOS  
施惟捷 Shih Wei Chieh

我自2013起在墨西哥駐村後有了第一次結合智慧材料和民族文化的啟發，後又在2017，2018發起了部落對抗機器計劃並和台灣泰雅文化合作後，又承辦了臺灣工藝研究發展中心專案，並因應疫情策劃了2020年的「來自未來的朋友」(Having Friends in the Future) 國際線上駐村和2021年的實體和線上展覽「來自未來的朋友—第三自然的纖維材料庫」。2020年的「來自未來的朋友」邀集來自跨域國際藝術家和台灣工藝師，以「工藝共地」為概念主軸於線上「推測式的」進行交流，以線上講座、線上工作坊、技術樣片 (swatch) 交換並集冊成書等行動，做為實體國際駐村交流之替代。爾後又在2021年的實體展覽策展活動中提出以「材料庫」概念裝置，推測設計一座以「材料」為交流形式的平台，為國際交流間提供公制，為跨域之間、國際之間的概念衝突、語言障礙提供共同語彙。

來自未來的朋友之後，我受到兩個合作邀請，由於我自西藏行動中產出的作品「溫室之心」涉及到利用奈米科技，製作一座由太陽能和植物共生的裝置，因此受到電子織品社群成員Tincuta Heinzl邀請成為她的駐村論文受訪對象，該論文DESIGNANO - The Aesthetics of Imperceptibility 訪問藝術家或是業餘科學家在沒有受過專業訓練下利用奈米技術的方法動機。另外一項邀請來自智利的Maria Jose River的邀請，I\_C計劃裡藉由Atacama Large Millimeter/submillimeter Array (ALMA)阿塔卡瑪大型毫米及次毫米波陣列天文干涉儀的資料，在資料視覺化的框架下，為印加文化的星座文化和當代天文資料建立連結。在此展覽中可以看見一些初步的實驗，如利用ADQL (Astronomy Data Query Language) 來定義印加暗星座的區塊，和將ALMA的運作方式：干涉學，轉換成雷射動作和雷射印染的織物作品，以及sonify這些暗星座座標的原型作品。



在蓋亞計劃GAIA ARCHIVE上用POLYGON和ADQL碼界定出HANP'ATU蟾蜍暗黑星座的「座標」－施惟捷



自星體資料視覺化產生的音象作品－施惟捷

## Introduction

The I\_C project was initiated by Maria Jose River and supported by ALMA (The Atacama Large Millimeter/submillimeter Array), an observatory in Chile located in the Andes Mountains. It is a collaborative project including Maria Jose River, Rigardo Vega from Chile, Shih Wei Chieh from Taiwan and Francesca Piñol from Barcelona. This project aims create a link for the contemporary and the ancient sky from the perspective of combining contemporary astronomy and cultural cosmology to represent the Incan dark constellation with contemporary data visualization in textile format. Further more, we hope this exhibition can be the beginning of the action “the patchwork of our sky”, as the first stop of the I\_C project in Taiwan. However in this exhibition it will be mostly Shih Wei Chieh’s part are presented physically, the other works from remote partners will be presented on the project site.

The other branch of this exhibition is about Shih Wei Chieh’s action in another high ground, a greenhouse project in Tibet in 2018. This community aim to provide a sustainable vegetable for a local charity school. An installation is made with the symbiosis of solar technology and plants, as the document for the trip.

## Maria Jose Ríos

Each and every one of us currently lives circulating with data and information of all kinds, these being a kind of element that relates and connects directly with the cultural and social environment, becoming part of a process and environment of iconographic reading of the reality, aspect of the data that will be worked on in this project from the textile in connection with the importance of Astronomy and its union with the art and culture that has been given to our territory from the pre-Columbian peoples: the Andean culture and in the Mapuches:

This is how the I\_C project proposes in a fundamental way to artistically explore the relationship between astronomy and the textile technique from its cultural value in traditional cultures, together with an exploration and action from the new digital technologies for the visualization of astronomical data, which many are open in ALMA Data Archive, enabling from the fabric made with tools and techniques that will allow (explained and described later): visualize and connect with them from the textile, which also allows a new possibility and support for data visualization, which will be based on the importance for our history and cultural identity, that of the ancient technique of weaving to the loom, continues to this day, but with certain digital, analog and current mechanics.

The loom is a type of tool that enables the creation of information supports, social and daily functions, and is important for the history of computing (the Jacquard loom as the first binary system) and of today's machines. This project focuses on ancestral technologies, explores them creatively to better appreciate the cultures that created this tool with great symbolic and social meaning, an important element of the cultural identity of our territories. ”<https://www.latercera.com/culto/2019/08/23/alianza-arte-astronomia/>

The cosmos is that mega-environment that unites and surrounds us globally, generating a global and interconnected cultural layer, which has happened since the configuration of all the aboriginal peoples of the planet, and that is how this project of a global cooperative nature and local to work with astronomy and data from the textile, a cultural support for the transmission of ancient and global information.

Interconnections work in Chile, with Taipei (Shih Wei Chieh) and with Barcelona weaving and making textiles as data display screens-surfaces.

This project aims to generate continuity, projecting into the future with its collaborative and global way of working, which also consists of making known a constellation of interdisciplinary people working at the level of Anthropology, artists, activists, designers and engineering of both materialities and of electronics and hardware.

## I\_C x ALMA x Laser Dye

This project in its great first stage, will be presented online from the ALMA OBSERVATORY channel under the direction of María José Ríos ([www.triptico.vestibles.cl](http://www.triptico.vestibles.cl)) in April 2022 with a date to be agreed, from where the entire work team and invited artists from Taiwan and Barcelona.

Shih Wei Chieh's involvement or participation as a connected reality of data and connected skies:

This project then, seeks to generate global or interplanetary connectivity about working with data, which in this case is astronomical data, with textiles and new technologies, and from these elements we believe as a project, giving importance to a network of connections global, to be able to visualize a technological technical work, from the techniques used for textiles in Asia and America historically. We know that cultures are different, but there is something that unites us: weaving and textiles as a cultural network and working with data as a cultural element (being Astronomical for this project).

Shih Wei Chieh is an artist known to us who has worked with ancestral tribes (in Asia), has a very complete relationship with artisanal and digital techniques, in addition to also working with data and was very interested in the proposal. Thus, there is also an ALMA regional office in Taiwan, and it is from there that Shih also found a connection and help. Shih Wei Chieh's work is very laborious or elaborate with the data. From Chile, the data was worked out in a more general and simpler way, not so analytically, being data on the chemical composition of the planets of our Solar System and the size of the planets of the same, 2 woven surfaces are being generated by means of machines of Norwegian digital mechanical loom; and this work of Weaving is being executed by Francesca Piñol from Barcelona, which when they are finished will be brought to Chile. So, the project generates this global network of execution and production of work, which shows an ability to connect and form collaborative constellations.

Another part that is carried out in Chile is a general documentation about the importance of textiles as a transmitter of astronomical information for the Andean cultures: Aymara, Incas, Paracas, among others; and also for the Mapuche cultures, all these cultures from South America. This written and video documentation will be online from the website [www.triptico.vestibles.cl](http://www.triptico.vestibles.cl), section I\_C project, and it is not a detailed investigation but was carried out by two artists who have anthropological and archaeological closeness to these cultures and apply them in his most creative work.

It is a project that from the archaeological and anthropological point of view is undertaken by artists, not specialists in the area.

On the other hand, a digital mechanical loom is being manufactured to play with images digitally and weave them: this part is an even more experimental experience, being this loom manufactured in a domestic way, which will be open source.

## **Shih Wei Chieh**

I have been inspired by the combination of smart materials and ethnic culture for the first time during my art residency in Mexico, Oaxaca in 2013. Later, in 2017 and 2018, I co-organized a science art camp with an Atayal group in Taiwan and artists from e-textile summer camp in Paillard, France under the name of "Tribe Against Machine" to create the exchange between traditional crafts and smart materials. After that, I curated an online residency program "Having Friends in the Future" with the National Taiwan Craftsmanship Research and Design Institute (NTCRI) in 2020. A total of 16 artists were invited from the United States, France, Israel, South Korea, Chile, Taiwan, Switzerland, China, Italy, and Greece to make an online exchange under the concept of "common ground of crafts" with the speculative spirits, in the format of lectures, workshops, swatch exchange and the co-creation of a swatch book as an substitute to physical art residency during the pandemic. Later, in 2021, A concept of "Material Library" was proposed as a performative installation, speculated to design a platform to provide a common vocabulary to reduce conceptual conflicts and language barriers in international collaboration in-between crafts, media art and conceptual art.



After Having Friends in the Future, I have received an invitation to give feedback, description about my experiments with DIY nanotechnologies in my project "The Mind of a Greenhouse" in the DESGINANO project. The project is coordinated by Tincuta Heinzl, who is resident at [IMERA](#), Marseille, France in 2021. Tincuta Heinzl undertakes to run the Project in cooperation with IMERA and in collaboration with 2580 Association.

I received an invitation from Maria Jose River from Chile to collaborate with the I\_C program together with the Atacama Large Millimeter/submillimeter Array (ALMA). The task is to establish a link between the constellation culture of the Inca and contemporary astronomical data. Some preliminary attempts can be seen in this exhibition, such as the use of ADQL (Astronomy Data Query Language) to define the blocks of the Inca dark constellation in sky, and the operation of ALMA telescope: the interferometry, which is converted to laser motion and laser exposure textile works.

## 4/23 講座 lecture

施惟捷 14:30-15:00

來自未來的朋友、I\_C計劃、部落對抗機器、雷射染計劃

我想介紹自己近年來組織的國際社群始末，從最近2020/2021在工藝中心舉辦過的一個關於工藝和科技合作的線上駐村計劃—來自未來的朋友，到這次Maria Jose Rios 發起的I\_C計劃中我的參與部份和其他藝術家的進度。也將介紹在本次展覽的作品中如何執行雷射染作品和其他數位作品中的天文資料視覺化，以及如何利用當代天文座標定義印加暗星座的位置等嘗試。

松下 聰 樹 15:00 - 15:30

ALMA, 黑洞, 以及他們和藝術的關係

ALMA (阿塔卡馬大毫米/亞毫米陣列) 是世界上最大的毫米波/亞毫米波干涉儀，位於智利北部的阿塔卡馬沙漠。它現在產生了许多美麗的恆星和星系天文圖像。最近，它還加入了事件視界望遠鏡 (EHT) 的觀測，並首次與全球其他毫米/亞毫米望遠鏡一起展示了黑洞陰影圖像。在本次演講中，我將解釋 ALMA 和 EHT 是什麼，它是如何工作的，到目前為止已經取得了哪些圖像，以及與藝術的關係。

Shih Wei Chieh 14:30 - 15:00

Having Friends in the Future, I\_C Project, Tribe Against Machine, Laser Dye Project

I'd love to introduce the international communities I have known in the recent year and the events we organized together. From the Having Friends in the Future 2020/2021, an online residency I organized with National Craftsmanship Research Design Institute (NTCRI). I will then introduce my part in this collective project I\_C project and the current progress of other artists in this project too. The last part I will explain my attempts in the works in this exhibition, including how I implement my technique "Laser Dye" in the works in this exhibition to data visualization the FITS datas from ALMA and Gaian archive.

Satoki Matsushita 15:00 - 15:30

ALMA, Black Hole, and Relation with Art

ALMA (Atacama Large Millimeter/submillimeter Array) is the biggest millimeter-/submillimeter-wave interferometer in the world, located at the Atacama Desert in northern Chile. It now produces a lot of beautiful astronomical images of stars and galaxies. Recently, it also joined in the Event Horizon Telescope (EHT) observations, and showed the black hole shadow image for the first time with other millimeter-/submillimeter telescopes all over the world. In this talk, I will explain what ALMA and EHT are, how it works, what images have been achieved so far, and relation with art.

## 講者介紹



施惟捷從事可穿戴藝術、電子紡織品、DIY雷射工程等領域的工作，他還是一位自學的材料研究者。他在2015年的“雷射染”計劃是關於如何結合雷射光學和傳統的氫版顯影來製造紡織圖案，這激發了他對材料科學、古代工藝與新媒體藝術的合作，以及尋找其背後的社會性意義的興趣。他是“部落對抗機器”（Tribe Against Machine）的創辦人，該項目旨在為古老工藝練習中的材料設計尋求靈感。他目前的研究方向是如何用DIY方法和現代適切（modern appropriate technology）技術的手段製作用植物染料製成的光敏紡織品和太陽能電池。此外，他正在探索一個獨立的，關於植物和使用植物染料太陽能共生的地球溫室系統（earthship）。

Shih Wei Chieh works with wearable art, e-textile, laser audiovisual, he's also a self-taught material researcher. His "Laser Dye" project in 2015, innovate how to print textile pattern by laser projection and cyanotype, which inspire his interests for material science and the collaboration between ancient craftsmanship and new media art, as well as the sociological mean behind the scene. He's the founder of "Tribe Against Machine", a project seeks inspiration for material design in ancient practices. He is current research is about how to make photosensitive textile and solar cell made with plants dye in DIY method and the mean of modern appropriate technology. Further more, he is exploring a self-standalone earthship greenhouse system which can be solar powered by plants dye.



松下聰樹是中央研究院天文學與天體物理研究所 (ASIAA) 的研究員。他目前是格陵蘭望遠鏡 (GLT) 的項目負責人，以及事件視界望遠鏡 (EHT) 台灣團隊的代表。他之前是 ALMA 的委託科學家，2010 年至 2011 年間曾在智利居住，以使 ALMA 從實驗工程階段轉變為可正式運作階段。在這個 I\_c 項目中，他提供了有關 ALMA 和干涉測量的建議。他還是 ALMA 長期基線活動的專家訪問者，並使 ALMA 能夠獲得非常高的空間分辨率圖像。

Satoki Matsushita is a Research Fellow at the Academia Sinica, Institute of Astronomy and Astrophysics (ASIAA). He is currently a project leader of the Greenland Telescope (GLT), and a representative of the Event Horizon Telescope (EHT) Taiwan team. He was a Commissioning Scientist of ALMA before, and used to live in Chile between 2010 and 2011 to make the ALMA from the delivered engineering quality to observable with science quality. In this I\_c project, he gave advice about ALMA and interferometry. He was also an Expert Visitor of ALMA for the long baseline campaigns, and made the ALMA possible to achieve very high spatial resolution images.

相關網站 project sites

[www.triptico.vestibles.cl](http://www.triptico.vestibles.cl)

[www.shihweichieh.com](http://www.shihweichieh.com)

<http://www.artnumerica.info/>