GALICIA FUTURA

TODO O QUE IMOS SER.

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Museo Centro Gaiás
Fundación Cidade da Cultura de Galicia
Santiago de Compostela

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EXHIBITION TEXTS
ANDAR 0

Coche Autónomo.

What could be more typical of dreams of the future than a self-driving car? Galicia has set a milestone in Spain by producing the first vehicle of this kind, which is part of the future wishes of dozens of generations. For such ingenuity to be possible, many of the ideas we have seen so far need to be applied, from precise cartographic recognition of the landscape to the maximum development of electronics and telecommunications. Even if we never lose the pleasure of guiding our own machines, the self-driving car is the ultimate expression of our ability to communicate to them what we need.

Robot NETA V3A

If there is one concept that our minds have associated with the future for decades, it is undoubtedly the term robot. This word of Czech origin was first created in science fiction before becoming a technological reality and it has made our imagination run wild. But we seldom think of its importance in generating well-being in the field of care, especially for the elderly or people with special needs. Whether it has the friendly humanoid appearance of the NETA V3A or other designs, the ability of robotics to carry and perform repetitive tasks will be complemented by its potential to accompany people in their daily lives.

HASME OIR

Fontán, Carta Xeométrica de Galicia 1817-1845
Vítor Mejuto, 2018

The mathematician and geographer Domingo Fontán created the first physical map made in Spain with mathematical measurements: the Carta Geométrica de Galicia (Geometric Chart of Galicia). It was such an important step that it was used as a reference for most of the Galician communications drawn up until the end of the 20th century. Today we bring it to the future as a welcome poster for “Galicia Futura” through Vítor Mejuto’s Fontán. It is a statement of intent. He immersed himself in the past and honours it by painting the present. Galicia’s future is that bright.

TERRITORIO QUE HABITAS

Guía postal de Lugo
Maruja Mallo, 1929

How do we imagine the future? Maruja Mallo’s avant-garde creative mind did so almost a hundred years ago by combining cultural heritage, traditions and dreams. In this work, commissioned by Lugo Provincial Council, she combines the main icons of Lugo with fantastic images of skyscrapers surrounded by aeroplanes or speeding race cars on winding roads. An image that remains a symbol of how we imagine the future by mixing the most radical advances with the roots of our past.

Como tizón quemado
Christian García Bello, 2015

It is inevitable to imagine ourselves inside this sculpture. It makes us ask ourselves how we perceive, inhabit and transform a territory.

This sculpture is a shelter, an elementary construction on a human scale conceived for us to observe the outside. Every material means something and they all refer to Galicia. The pine wood is protected with powdered charcoal, the residue of its own combustion, as if the material were transiting between the living and the inert. The ropes allude to the maritime world. They trace a structure we can pierce with our eyes and they make us feel what it would be like to live in it.
**TERRITORIO QUE MUTAS**

**Recanto da paisaxe habitada**

What will the inhabited landscape of the future be like? One of the main questions we always want to answer about our future is how we will build it, what our living and working spaces will be like, but also how they will relate to nature. These nine examples of architecture show us how buildings will relate to the landscape and to people. Nine icons that propose standards for future architecture deep-rooted in tradition, mixed with modern techniques and materials. Through the eyes of Juan Lesta, Vítor Mejuto and Damián Ucieda, we build windows onto the human and natural territory of Galicia Futura.

**O rapto da paisaxe**

Caxigueiro, 2006

Scattered Galicia, dispersed Galicia. Population dispersion is part of our most intimate cultural heritage, and at the same time it is one of our greatest challenges as a society. Galician soil, as an infinite inhabited landscape, where there is a home in any corner, is our play mat in the future. Making this dispersion compatible with the quality of life of our times is one of the great challenges on the table in practically all areas, from education to telecommunications.

**UNIVERSAL E NOSA**

**Canto de las espigas**

Maruja Mallo, 1929

The future is in the roots. Perhaps Maruja Mallo would have agreed with this idea. In the 1930s, when she created her series on the Religión del Trabajo (Religion of Work) in her Argentinean exile, she placed the primary sector at the centre of her creation. She turned the labours of the sea and the countryside into icons, almost like altar images. This relationship between Mallo’s modernity and agriculture or fishing makes her, almost a century earlier, an observer of the future, having understood that these sectors not only contain part of our identity, but also a key part of our well-being.

**S/t. (La pareja del año) Serie Dopo Roma**

Jesús Madriñán, 2016

The portrait of a young couple leaving an after-hours club. What is the truth? Those portrayed show through their gestures, clothes and attitude what they want to reveal. What is their social, economic or cultural context? What is their identity? They choose what to show, and what to leave out. The artist acts as though he does not exist, he does not condition them, but the photograph is just an instant captured by his eyes. We are halfway between the creation of the person portrayed and their apparent frankness. Beautiful is not the opposite of ugly, but rather of fake.

**CROMOSOMA HÍBRIDO**

**Peliqueiros**

Chelo Matesanz, 2007

Tradition is our main differential value. Ancestral customs such as one of the oldest carnivals in the world become pop icons, representative of our rich future, which continues to dialogue with the past. An agricultural process as remote as the rapa das bestas (Shaving the Beasts) is transformed into emotion and recognition of our cultural essence and its representation to the outside world. We know and recognise ourselves in our traditions, which are as modern today as they were yesterday. Cultural identity is our best quality label.
Pandeiretas artesanais
Foliqueiras, 2021
Surely there is no better example of the fusion of one’s own roots with external influences than music, where combining what we are with what is done in the rest of the world creates new identities that are assimilated as our own. An example of this process is the tambourine, a foreign musical instrument in Galicia that has become one of our most recognisable cultural emblems in recent centuries. The Galician tambourine, which is at the top of the evolutionary chain of its instrumental family, has been the channel of musical expression for women in Galicia and continues to be one of the symbols of our cultural identity.

ANTROPÓMÉTRAS

antropo-
1. word element meaning ‘man’.

-metra
1. word element meaning ‘the one who measures’.

How long does a second last? How big is a ferrado? It depends. The size of a ferrado varies depending on the municipality, because it depends on how fertile its lands are.

How we inhabit the landscape, how we transform it, what our bodies are like or our perception of the passing of time are sensitive units of measure.

The generation of contemporary artists share formal similarities (they are austere, monochrome, dark) and, above all, theoretical: humans are their unit of measure. In a couple of decades, they will appear in art history books and their generation will have a name—they are the anthropometrists.

Ramo vermello
Luís Seoane, 1969
Cerámica de Sargadelos
The Ramo vermello by Sargadelos is fruit of the Laboratory of Forms of Isaac Díaz Pardo and Luís Seoane, inspired by the bread figurines of Santo Andrés de Teixido. Maybe they were the first Galician anthropometrists, studying forms through human habits. Ultimately, tradition, culture, and identity can be kneaded like breadcrumbs and crystallise over time. This piece keeps those uncorrupted forms, in the full crystalline state of the ceramic, within everybody’s reach. It shows what we are, it elevates who we are. Contemporary Galician artists, those who are writing the history of art in Galicia, took up the challenge; they are the legacy of that “novo rexionalismo”. They have identity, they are from the land, and let it show. Son dun lugar onde o vento está cargado de sal (They are from a place where the wind is laden with salt).

Galeria de Arte Futura (Varios Artistas)

Loose Fit
Ángela de La Cruz, 2002
Imagine that all of a sudden, your body is too small for you. This is what is represented by this picture-sculpture in which the canvas is loose in the frame. It makes you want to stretch it, to put it in a larger frame and for the picture to “go back to what it was”. The artist achieves this effect thanks to a plastic paint created with oil emulsion.

S/t. (retablo branco, axis negro)
Álvaro Negro, 2018
The altarpiece is the architectural, pictorial and sculptural structure behind the altar in Catholic churches. The axis is the cross of Christ or the Latin cross plan common in churches. The divine and the human appear in this work in an essential form: a body in the form of a T hanging; a body in the form of a T resting on the ground.
Hortus conclusus (prasio)
Tamara Feijoo

The artist investigates the passage of time, transcendence and its physical manifestations in the form of footprints, wear and tear and patina. This work explores the painting process.

DOODVEW, “dead colour” in Dutch, is a “poor” colour that provided the mid-tones in the paintings of the Flemish Primitives. Thin layers or glazes of bright, translucent colours mixed with a viscous medium such as oil paint are applied over it. The presence of this first opaque layer provides greater depth and verisimilitude and allows the light to be reflected more realistically.

S/t. (Azul Lluvia)
Manuel Eirís, 2019

This is a portrait of time. The layers of paint talk to us of the passing of time, of memory. This artist began by unpainting. They call him the “archaeological painter”. He now paints monochromes of dozens of coats of paint. Between one layer and the next, time must be set aside for overpainting, which is different for an oil painting than for an acrylic painting. A painting with more than a hundred layers takes a lot of time. Layer upon layer, this work is like the rain that falls, soaks and transforms the colour of the pavements.

S/t. (KP.19.12)
Kiko Pérez, 2019

It is like the plan of a room in which furniture adapt to routines. This one connects with this one and this one is turned to have better access to the window, or rather I should move everything to generate new routines. The same, but applied to the logical mechanisms of painting. Design adapts to the human measure, art investigates humans as a unit of measure.

Grime II
Christian García Bello, 2017

The lead of a pencil is composed of carbon graphite, clay and grease. This work is a sophisticated pencil drawing on paper, only that the pencil has been created using as a pigment our geological legacy: a soot-laden stratum, rubber dust, brick, plastic, clay, concrete—ultimately, carbon, in its humanised forms. The artist mixes graphite and oil (the fatty binder of the noble paint) and with it he paints by mechanically dragging a piece of sandpaper, prepared to contain the trace. This is the footprint of humankind.

DUN ASTRO

Everything is made up of atoms. Each one was born in a star. Their combination gave birth to all materials. Throughout history, the dominant materials of any given period have marked the great changes of era. Stone Age, Iron Age, Bronze Age... What material will lend a name to the ages of the future?

Puñal de antenas, s. IV-I a.C

Can a prehistoric dagger talk to us about the future? In the history of mankind we have measured major changes in terms of materials: the Bronze Age, the Iron Age... but also the age of steel or plastic. Innovations in materials give mankind a big push into the future. That is why so many people are working on trying to find out which material will mark the next age.

Concrete.
Proyectos Biovalvo (mexillón) e Straduravius (polímeros)

Concrete is a material composed mainly of three materials: cement, aggregates and water. Aggregates are usually gravel or sand. And the paste formed by cement and water serves as a glue; it is what gives the concrete the ability to set (harden). If it is reinforced concrete, it has a steel skeleton inside.

New concretes, as an outcome of the BIOVALBO project, contain mussel shells as aggregates. It is a way to transform waste into a resource. It has not been easy, as shells have a large quantity of salts that can corrode the formwork of the concrete and accelerate its degradation. These are the sample pieces used in material testing.
Concrete with plastic could resolve the problem of corrosion in coastal areas. Concrete structures are being designed with fibre-reinforced polymers (basalt, glass, aramid or carbon) that have proven to be durable and sustainable. The piece of the STRADURAVIUS project is concrete with a glass-fibre reinforced polyethylene (GRP) sheet bonded on each side. It is tensile tested, which is why you can see the remains of the instrumentation and the cracks under the reinforcement.

**Peza da colección Lítica**  
*Verónica Moar, 2020*

All materials, including those that belong to the sphere of the useless, store beauty inside. There is a universe of interlaced atoms following different geometric arrangements that chemists describe, craftsmen use and artists employ as a language.

The piece of the Lithic collection expresses just that. It is a porcelain stone containing gold, real gold, that explodes from inside. All the materials have hidden beauty of great value. To appreciate them, we need to understand them and observe them.

**Pezas de porcelana impresas en 3D, 2020**

3D printing is used primarily with plastic and metal, but since 2015 3D printing of ceramics has been gaining ground in art, crafts and, above all, aviation. The proportions of the ceramic material—the quantities of clay, water, etc.—are calculated based on the piece’s design. The capacity of the piece not to collapse or for the layers to adhere to each other depends on this.

These little sculptures, inspired in natural forms, function as artist proofs. They show that, both for science and art, trial and error is part of the process and that their work is essentially the same.

**FINSA + XERA**

Every year, more than one million tonnes of waste wood are collected from pallets, fruit crates, construction waste, etc. Most of it is recovered through separation and processing to give it a second life as technical wood and chipboard, thus maintaining the wood cycle and enhancing the territory’s materials. The surplus is used in the form of biomass as a source of energy.

Wood waste is being transformed into resources thanks to XERA (Galician Agency for Forest-Based Industry) and companies such as Finsa, a Galician multinational with a strong commitment to the land, sustainability and circularity.

**Longboard made of carbon fibre sandwich and wood**  
**Stool made of carbon fibre and wood composite material**  
**VALORNATURE Project by XERA (Galician Agency for Forest-Based Industry)**

Conventional carbon fibre is obtained from petroleum. Now it is also possible to obtain carbon fibre from lignin, an organic polymer found in wood in a similar percentage to cellulose. Until now, paper industries extracted cellulose from wood and discarded lignin because it is causes paper to yellow.

The combination of wood, plastic polymers and plant-based carbon fibre is being used to manufacture more sustainable and high-performance composites.

**Sports stadium seat made of WPC (Wood Plastic Composite)**  
**VALORNATURE Project by XERA (Galician Agency for Forest-Based Industry)**

WPC is a mixture of natural wood (wood or cellulose fibres and flours) with polymers (recycled or virgin plastics, such as polypropylene or PVC) to obtain a sustainable composite material, with excellent structural properties and more durability and resistance than traditional wood.

**Digital wood printing**

Wood-derived boards, reinvented through additive manufacturing of wood fibre composites with PLA (polylactic acid), which is a biodegradable plastic. It is manufactured using FDM (fused deposition modelling), 3D printing technology. This produces grooved and textured low-density boards.
WOODTURE.
Research into new materials by Finsa in collaboration with Lara Álvarez Bosch.

A research project on materials, sustainable design and creativity based on recycled raw materials (sheet metal, sawdust, wood chips, shavings...), commonly used for the production of materials with parallelepipeded geometries or coatings, combined with experimental plant-based resins. Materials have been obtained with technical properties similar to felt (insulating, warm and mouldable); to flexible sheet metal; to leather (elastic, with a rubber-like polymeric feel, non-slip and light), and to other rigid materials with different reliefs and textures.

Finsa Infinite Tricoya®
This is an innovative high-performance MDF (medium density fibreboard) board that uses a patented acetylated wood manufacturing technology that makes the material hydrophobic (water-repellent), preventing it from swelling and deforming with humidity and making it stable and durable for windows, façades, garden furniture and even swimming pool wall cladding.

MOITO POR SACHAR
When you go to a supermarket in another country, you observe everything carefully, as though you were viewing a great exhibition of everyday life in the place. What people produce, what they eat, what they use for cleaning, how much it costs to live there.

All objects deserve to be contemplated from a position of unfamiliarity and with dedication, as though we were observing them for the first time. Like tourists. Get an everyday object, place it on a stand in a museum and you will have turned it into art. That is the definition of ready-made. That is why there is a supermarket display full of products that for Galicians are normal, everyday things. They describe our economy, our tradition, our uses and customs. The primary sector for us is a question of identity.

Peza da serie “Esculturas de andar por casa”
Rosendo Cid, 2010
Sculptures that are photographs of everyday, easily recognisable objects. Like portraits of objects handled after a long lunch. They are homespun ready-mades that serve to highlight that the perspective of everyday things is the one that converts ordinary objects into extraordinary ones.

CONSTELACIÓNS
The landscape is one of the elements that most characterises Galicia.

People who live in this part of the world and those who come from other places assimilate from the outset that our natural environment is one of the distinguishing features of this land. As in Urbano Lugris’ dream-like landscape, many of the icons that identify Galicia are in our landscape. But this landscape is sometimes complex and escapes us, or mysterious and unknown to us, as in the steamboats of Murado’s painting. Human beings have their raison d’être in the management of the landscape and in its use, which must be sustainable if our future is to be a long one. This issue is so important that we have actually been talking about it throughout the whole exhibition. The great challenge of “Galicia Futura” (the Galicia of the Future) is to build a balanced and healthy relationship with our natural heritage.

O futuro son as cabras
Oliver Laxe, 2021
Goats are the future of Galicia, as they work to regenerate land devastated by forest fires. A metaphor for the return to the primary sector, the reopening of our ancestors’ houses and the return to smallholdings as a model for a more natural relationship with the environment.

Oliver Laxe expresses this metaphor of the simplicity of small things and of a Galician landscape that recovers with its own natural rhythms. Leaving aside the urgencies of current life, the future is looking to tradition and rooting oneself in it unabashed in order to face the future. To recover a time that flows to the rhythm of the countryside. Caring for the landscape and allowing ourselves to be cared for by it.
UNE OS PUNTOS

More than a thousand years later, people are still walking to Santiago de Compostela because the journey is part of who we are as human beings. For centuries it was only Europeans and Christians, but today people of all origins and beliefs walk to Santiago de Compostela. We are not going to discover in this exhibition that the Way of St. James is Galicia’s main hallmark worldwide, at all levels, from culture to tourism. We experienced this explosion at the turn of the century and recent decades have served to consolidate a real window of opportunity: to place our cultural heritage at the heart of who we are. Is there anything more modern than this? A Way with centuries of history, but which changes with each passing year and with each step that is walked along it. A Way there and back that connects us with the world.

Travesía
Rubén Ramos Balsa, 2021

The journey is one of the main, most successful metaphors for building the future. In Galicia we know a lot about journeys, migrations and Ways. Rubén Ramos Balsa’s delicate technological poetry launches these ideas on the surface of an old piece of furniture. The past and the future. Heritage and what is still to come. Technology is not only used to create gadgets that make our lives easier: it is also the raw material for artistic pieces like this one, which surprise and challenge us.

Vieira de peregrino, ca. 1120
Museo das Peregrinacións de de Santiago

From the bottom of the Galician estuaries to becoming one of Europe’s most recognisable icons, the scallop is an example of how the indigenous becomes global. Since the Middle Ages, this typical Galician bivalve has been the symbol of the people who finish The Way of St James: emblem of the chapter of Compostela, its sale was restricted to Santiago, where pilgrims bought them to decorate their clothes on their return journey through Europe. It has had such a close relationship with the Way for a thousand years that in 1758 Linnaeus named this species Pecten jacobaeus. Today it guides travellers to their finish line in Santiago from thousands of signs across the continent and it has become arguably the most successful logo in the last thousand years of European history.

Imaxes para o video realizado a partir de Modelo 3D do obxecto orixinal
Marxe / Elipseeg.com para Fundación Catedral de Santiago

Cultural heritage is moving towards a future of virtualisation. The Internet, together with the constant advance of digital technology and the power of social networks, enable us to discover distant heritage elements without ever having visited them in person. These technologies are also very useful for documenting the current state of artistic heritage and supporting its conservation, as in the case of the Cathedral of Santiago de Compostela.

CÓIDAME INTRO

The future of medicine is personalised medicine. It is already the present, thanks in large part to the important contributions of science made in Galicia. Personalised medicine consists in making specific diagnoses and treatments, designed ad hoc for each person and each pathology. Central to this are three fields in which we in Galicia are international leaders: nanoscience, genomics and artificial intelligence.

Un SUPERORGANISMO en la sala
Clara Cerviño, 2021

Galicia is an international leader in genomics. Our idyll with the study of genes is marked by our land. It all started out with the study of the genetic diversity in our mussel and continued with its application in the diagnosis and treatment of human diseases. The most important groups are the forensic, clinical and population genomics groups led by Ángel Carracedo, and those on immunology and marine genomics led by Antonio Figueras.
What is genomics?

Genetic material is the instructions manual all living beings have and which sets out what we are like. Genetic material is in our cells, in the cells of chestnuts, figs, cows, goats, mussels or any other living beings. This manual is written with the 4 letters of DNA, which are grouped together to form words, and these words form sentences. When one of these phrases is a complete instruction, we call it a “gene”. To a large extent, genes describe (codify) what we are like: height, skin colour, some pathologies, etc.

Genomics is a branch of biology that aims to predict the function of the genes based on their sequences (words and sentences of DNA). This enables us to make much more precise disease diagnoses, also in the case of rare diseases, in order to address them in an innovative way through gene therapies. This, which is so useful for humans, we also use for other living beings and thanks to other living beings. From mussels to people.

The pan genome of Mytilus galloprovincialis

This marine invertebrate has a fascinating genome—specifically, a pan genome. Of the 65,000 genes that contain all the genetic information of the mussel (compared to the 30,000 genes of the human being), 20,000 of these can vary from one individual to another.

From now on, when you see a group of mussels crowded together on a rock, do not think they are all brothers and sisters, but rather you are standing before a battalion of superorganisms of the most diverse kinds, ready to withstand all sorts of adversities.

An all-terrain survivor

Thanks to variations in its genetics, this bivalve can adapt to all kinds of environmental conditions and can live in and out of water.

Out of water, it survives without oxygen exchange at temperatures that range from over 40 °C in summer (inside the shell) to 7 °C in winter, while withstanding wide salinity variations (15-20 mg/L in rain, 35 mg/L in water).

In water it attaches to rocks to survive, withstanding waves, or clings to the ropes of the mussel beds, overcrowded and under pressure from all its neighbours, bearing enormous weight and tension, in addition to attacks from other marine predators.

Two aces under the table

– The gills: an organ that allows them to breathe and feed and which are ultimately the barrier through which everything that enters the internal system of the animal passes. Thanks to the macrophage cells of its innate immune system, the mussel is also prepared to withstand attack by any agent that penetrates through its gills, water pollution, the presence of microplastics, attacks by viruses and toxins—some of them lethal to humans such as toxin Alexandrinum catenella (responsible for the harmful red tides)—, in addition to being able to synthesise antibacterial peptides that could (some) be used to cure herpes in humans.

– Byssus: mussels secrete this very strong filament and can have between 50 and 100 threads per individual. These filaments allow them to attach securely to the substrate, as well as to bear a lot of weight for their size, and they can self-repair when they wear out. This “marine silk” has been used since ancient times to make fabric, and it is currently being studied to develop new glues that can be applied even to attach medical devices in human implants.

The gills allow this 5 cm mussel to filter 5 L of water every hour. This is why chemists use mussels to study the quality of water, because everything passes through them.

Dispositivo de electroforesis
Instituto de Investigaciones Marinas, CSIC
Universidade de Vigo

This electrophoresis equipment is used to separate DNA fragments.

DNA samples are loaded into wells (indentations) at the end of a gel and an electric current is applied that pulls them at different speeds depending on their charge and mass. The DNA fragments have the same negative charge, so they move towards the positive electrode, but the smaller ones move through the gel faster than the larger ones, so this equipment is used to separate DNA fragments by size.

The gel is stained with a pigment that binds to DNA; thus, the DNA fragments can be seen as bands, which represent a group of DNA fragments of the same size.
ATMÓSFERA NAS MANS

Forest fires or river and maritime pollution are a direct consequence of global warming. The appearance of new animal diseases and how these end up affecting humans (a process called zoonosis) are also an indirect consequence. Thus, using technologies that serve to protect the landscape, map geography and detect and foresee environmental accidents is also a way of safeguarding animal and human health, as well as stopping global warming and tackling the problem at its source through the use of new cooling materials.

The appreciation of the landscape and the value of the primary sector so typical of the Galician identity has been the driving force compelling us to become leaders in research in materials science and technology applied to environmental protection.

**LUA, Helicóptero autónomo**  
Babcock International e Xunta de Galicia

Remotely piloted aircraft are the future of the Galician landscape. Thanks to audio-visual fiction, we associate this type of vehicle with modernity and cutting-edge technology, but we are not usually aware of its importance in environmental protection, fire prevention, natural resource monitoring and pollution control. The generalisation of these devices will allow for greater efficiency in crucial challenges such as fighting forest fires.

**Báscula barocalórica**  
CICA-UDC e UCD Sólidos

This platform is placed on pistons containing Perovskiña. They are connected to a temperature sensor. Get on the platform and see how your weight, by deforming the structure of the Perovskiña, makes the temperature drop. Perovskiña cools as a result of pressure. Maybe we could cool mobile phones or computers making use of the pressure of fingers when typing, cool athletes’ footwear or cool whole buildings by placing these materials on the ground to be powered by the weight of people, without the need for expensive, polluting air conditioning.

**Perovskiña**

**Estrutura cristalina**  
Universidade da Coruña, CICA e UDCsólidos

Perovskiña is a solid refrigerant. It has a three-dimensional structure called perovskite, from which the name Perovskiña derives, in honour of its Galician origin. It is easy to synthesise, its components are inexpensive, none are toxic, and it is also light and compact.

Perovskiña is a phase transition material, only instead of being a traditional change of state (from solid to liquid or from liquid to gas) it is a phase change between two different solid states. When pressure is applied, these atoms all crowd together and, as it regains its shape, the material cools down.

Therefore, Perovskiña is a barocaloric material: “bar” as units of pressure, bars; and “caloric” because it changes in temperature.

In Galicia we have spent years researching perovskites for their application in photovoltaic energy. Measuring how pressure affected some of these materials revealed their potential use as refrigerants. It is common in science, especially in basic science, for an investigation to end up revealing an unexpected application of great value.

**Diferenza térmica nun porrón de auga.**

**Gravación cámara térmica:** @thermogramer

**Artesanía de Buño:** Emilio e Manolo Caamaño, 2021

A consequence of global warming is that, between now and 2050, the energy we use for cooling will exceed the energy we use for heating. Not only fridges cool. All devices need constant cooling. Refrigeration technologies work thanks to compounds called ‘phase change materials’. They are compounds that can easily go from a liquid state (or phase) to a gaseous state and in this phase transition, they absorb heat; in other words, they cool down.

Thanks to this phase shift, the botijo cools water. The water inside the botijo penetrates the ceramic and forms a thin layer of moisture on the outside. This layer of water, due to the high outside temperature, evaporates, cooling the jug.
The thermal imaging camera shows the difference in temperature of the empty botijo (higher temperature) and the botijo full of water (lower temperature) through a gradient of colours. Similarly, a refrigerant gas circulates inside the refrigerators that is cyclically compressed and expanded, expelling heat through the back of the refrigerator and absorbing heat from the interior and cooling the food. The problem is that the main refrigerant fluids have a high environmental impact, so they will be phased out of the market. A sustainable and safe alternative is to eliminate fluid refrigerants and use solids instead. Solid refrigerants are a field of research led by Galician science from which one of the most promising patents for the future of refrigeration has emerged: the “Perovskiña”.

**URDIMENTA**

Fashion is identity. For Galicia, it has also been an economic and creative powerhouse. A journey that began with a fabric—linen—that placed our name on the world map of fashion. In the forties, Refrey became a benchmark in sewing machines, and in the sixties, the first sewing workshops opened. Regojo was the surname of one of those pioneers who began to industrialise the sector and one of the few that changed advertising forever when they used the image of Salvador Dalí as an advert for their shirts. In the eighties, small textile companies developed into brands with their own identity. Soon Adolfo Domínguez arrived, shortly after followed by Roberto Verino. The success of some infected others. In addition to the strength of Inditex, the world’s leading textile group, which has maintained the business model it started in the 1980s by focusing on continuous renewal, there are other firms that are also key to the Galician fashion industry, such as Bimba & Lola or Sociedad Textil Lonia.

The future of Galician fashion is changing course towards sustainable fashion, which seeks to reduce environmental impact by creating special pieces that last and small brands with personality that showcase innovation and creativity. At the same time, the textile ecosystem is looking for new fibres, which has led many firms and companies to research and create their designs from ecological fabrics using environmentally friendly techniques with low impact and investing on the upcycling technique, which consists of deconstructing and redesigning garments by transforming textile waste into resources. Sustainability is fashionable; our lives are at stake. We are starting to use textile fibres synthesised from casein, a milk protein; 0-km denim, obtained with production methods and raw materials with a low environmental impact; and we are recycling textile waste into fibre for the automotive and paper industries, as building insulators, cleaning cloths, and even in yarn manufacturers for making new garments.

**Reproducción dun tear vertical de pesas**

*Museo Castro de Viladonga*

Linen has been a key textile material in traditional Galician culture since ancient times. With tools seldom used anymore, such as spinning wheels and looms, the different pieces of the traditional costumes of the rural world were made by hand.

**Sen título (secuencia #0)**

*Lucía García Rey + Hugo Aldatz, 2021*

The act of dressing is an act of identity. Identity as a species, in the almost automatic gesture of dressing, as portrayed by these photographs. Identity as an essential part of our culture. Identity as a form of artistic expression; the information we give without using words. There is a discourse in the clothes we choose to wear; and in some cases it is even a compromise.
CURIOSA MENTE

How we communicate between people, how we communicate with machines, and how machines communicate with each other. From the plastic dimension of sensitive language the arts offer us, to the drift of literature, to the multilayer circuits that make up the brains of machines, to the algorithms that translate the complexity of our natural language into the confined computational language. The future lies in universal communication. Something inherent in the arts, which transcends local materials and languages to reach the whole world, is now fundamental to the future of science and technology. Will machines be able to read poetry?

Sen título
Tatiana Medal, 2001

This painting could summarise the whole of Galicia Futura, almost like a treasure map that leads us to tomorrow. It contains overlapping strokes, as in the integrated circuits that help us communicate with machines, but also as in the towns and cities, whose streets and squares it appears to reproduce. It does not represent anything we can identify, but, at the same time, we could well imagine what is drawn in it. There is no infallible recipe to the future, but the cartographic order evoked by Tatiana Medal could be a good route.

TELEVÉS

MOSAIQ6, signal meter

Conductive materials

New conductive materials such as gallium arsenide (GaAs), que é un material semiconductor which has the ability to carry electrical charges faster than traditional silicon, and so their use in telecommunications applications or in the manufacture of photocells brings far greater advantages. The handling and assembly techniques of this type of integrated circuit require highly advanced investments and industrial specialisation.

Multilayer HDI circuit used in the MOSAIQ6

Multilayer printed circuit boards (PCB)

They are like a lasagne of fine layers of interconnected circuits taking up the space of one. They allow greater connectivity between electronic components through the different layers, exponentially increasing the performance of an electronic circuit in smaller dimensions.

MMIC (Monolithic Microwave Integrated Circuit) wafer

The continuing advance of electronic miniaturisation

Smaller means more profitable and more sustainable. It is a constantly evolving process that allows more functionality to be added in a smaller physical area.

Galicia Futura, Manuel Vázquez

“Galicia Futura” has been a process, not a destination. We wanted to bring you glimpses of people who are building the future, in the present. In order not to miss any of the valuable knowledge contributed by the dozens of men and women who have participated in this exhibition, we asked the artist and strategic designer Manuel Vázquez to become the detective of the future. The result is this mural, where you can trace all the ideas that we have been developing for months. A treasure map that summarises, through art and words, the path of our common future.

Campo de figos
Marta Pazos, 2021

By definition, folklore connects with our deepest fears to weave a story whose main purpose is its own continuity. This is the case of our female mythical figures par excellence: the meigas, a sign of Galician identity built to provoke a dialogue with future generations. Marta Pazos proposes their resignification as a feminine icon of Galicia Futura through the symbolism of the fig tree and its fruit, which, despite being probably the most influential tree in the history of humanity, has been encumbered with the image of danger due to its association with female
magic. The fig field revolves around the idea of female empowerment, using the metaphor of techno-witchcraft and other beliefs with great projection in the folklore of our future. A unique sensory experience, created as a metaphor that the audience can experience first-hand.

360

And how do you imagine the future of Galicia?

Get involved and be part of the exhibition by helping us to build a bank of words and concepts related to Galicia Futura. Because we all make the future, the words contributed by the people who have visited us are incorporated into the exhibition through the projections that you have seen in the room.

Foro do futuro 2. Casilda, Manolo e Maruja
Dirección: Matías Tarrio / Producción: Islandia
2021

OLLAR

The future is, above all, altruism, because it is based on the generosity of improving the world for those who will come after us. That is why the wisdom of our elders closes this exhibition. Because no one can offer us a wiser look at Galicia Futura than those who have the past future in their memory. A wisdom full of generosity towards the future that they want to leave for the generations to come.

TEXTOMATÓN

Conveyors of messages. In our everyday life, we interact, we express our emotions, we laugh and hate through typography. We naturally turn to typography, or perceive through it emotions and opinions that go far beyond its content. As a central graphic element of this exhibition, “Galicia Futura”, and with the aim of reflecting its content and spirit, a typeface has been precisely designed. Or, better said, a typographic artefact composed of three typefaces.

Three modular, monospaced typefaces that, like the works in the exhibition, when they overlap and combine, make the element readable and understandable, like the layers of knowledge the spectator discovers and connects in “Galicia Futura”. Three typefaces that are a form, yes, but also a message, and now become a tool open to the public to download, use and modify, so people can construct their own messages.