FRANCE - CHILI : TRENTE TROISIEME APPEL A PROJETS ECOS Sud - ANID (2025)

Tableau récapitulatif des projets sélectionnés

Code projet	Abstract	Titre du projet	Responsable français	Responsable Chilien
C25B01	Biostimulants based on rhizosphere microorganisms are frequently proposed as a biotechnological alternative to improve the growth and abiotic stress tolerance of plants in agriculture, particularly under climate change scenario. In this context, magnetotactic bacteria are widely distributed in nature, able to perform mutualistic symbioses with other organisms, and suggested for biotechnological applications in diverse fields. Plant science and agriculture are not an exception, and recent studies have suggested the bioprospecting of magnetostatic bacteria to enhance soil nutrient availability and salt tolerance of plants. However, magnetotactic bacteria as biostimulants have not been studied thus far. Under this scenario, Chilean winter fall-Valdivian Forest is considered a biodiversity hotspot in the Globe, and therefore, represent an ecosystem harboring unique habitats, such as peatlands, and unexplored source of novel microorganisms associated with endemic plants. In this project, we propose to explore the rhizosphere of plants in peatlands of Chilean winter fall-Valdivian Forest as a reservoir for the bioprospecting of magnetotactic bacteria to improve the plant growth under waterlogging conditions. First, we will focus on the identification and characterization of populations of magnetotactic bacteria from the rhizosphere of endemic plants grown in peatlands of Chilean winter fall-Valdivian Forest. Later, we propose to isolate and characterize culturable magnetotactic bacteria from the rhizosphere of plants by in situ cultivation and to evaluate the effect of selected culturable magnetotactic bacteria on plant growth under waterlogging conditions. Finally, a cooperative Chile-France network focused on ecology and bioprospecting of environmental magnetotactic bacteria is suggested. As result of the project, we expect to (1) detect the occurrence and describe the diversity of magnetotactic bacterial populations in the rhizosphere of peatlands of Chilean winter fall-Valdivian Forest, (2) isolate and characterize novel axenic cultures of magnetotactic bacterial strains, and (3) formulate a bacterial consortium able to improve the tolerance of plants under waterlogging conditions. In addition, relevant results of this proposal are referred to the training of Chilean and France young scientists on ecology and diversity of rhizosphere magnetotactic bacteria as well as their potential as biotechnological tools in agriculture and conservation of Chilean winter fall-Valdivian Forest, including members of academia-industry-public stakeholders.	Exploration of the rhizospheres of plants in peatlands of the Chilean winter fall-Valdivian Forest as a reservoir for the bioprospecting of magnetotactic bacteria to improve the plant growth under waterlogging conditions	**LEFEVRE Christopher** CEA/CNRS/Aix-Marseille University, UMR 7265 CEA	**JORQUERA TAPIA Milko** Universidad de La Frontera, Temuco

C25B02	Immunometabolism focuses on unraveling the metabolic pathways of immune cells in health and disease. In cancer, the modulation of cell metabolism is relevant for both innate and adaptive immunity as the tumor microenvironment (TME) can influence their metabolic reprogramming. Extracellular vesicles (EVs), including exosomes, microvesicles, and mitochondria-derived vesicles (MDVs), play a pivotal role in the regulation of immunometabolism within the TME. Despite that several publications have demonstrated the relevant role of EVs in cancer, the recently described heterogeneity of EVs, the diversity of cancer types with different pathophysiology and the ongoing discovery of metabolic pathways associated with cell function, point out that this field requires a deep exploration of how different subtypes of EVs regulate immunometabolism in cancer. For this reason, two ongoing framework projects, one related to the modulation of immunometabolism in oral cancer by mitochondria transfer, and the other focused on the analysis of the immunoregulatory role of different Evs subtypes in triple negative breast cancer give rise to this ECOS collaborative proposal. This project aims to understanding how tumor-derived EVs or mitochondria-derived vesicles (mitoEVs) modulate innate and adaptive immune responses in breast and oral cancer. Whereas one partner has expertise in mitochondria transfer and the effect of this organelle exchange in T cell exhaustion in oral cancer, the other partner brings extensive expertise on the of heterogeneity of EVs subtypes, tools to modulate their secretion, and the impact on EV capture and immune cell function in triple negative breast cancer. We also aim to support PhD and MSc programs in both countries and to participate in several collaborative activities such as mission, stays, seminars, summer school and symposia. We expect to finish this project with two publications, one lead by the Chilean and one lead by the French research group.	Study of the metabolism and functional regulation of immunity by tumor-derived extracellular vesicles or mitochondria-derived vesicles from breast and oral cancer cells.	**Lorena MARTIN JAULAR** Institut Curie , PARIS	**Estefanía Andrea NOVA LAMPERTI** Universidad de Concepción, Concepción
C25B03	Congenital long QT syndrome (LQTS) is a genetic disorder affecting the heart's rhythm, often leading to sudden loss of heart function in otherwise healthy young individuals. With a prevalence of 1 to 2000 births, it is the most common inherited channelopathy worldwide. Variants of KCNH2, the gene encoding the hERG potassium channel subunit responsible for cardiomyocyte repolarization, account for 30–45% of LQTS cases. hERG dysfunction prolongs repolarization and can trigger life-threatening arrhythmias. More than 1,600 KCNH2 missense variants have been reported in VarSome, yet their functional characterization remains a major bottleneck. High-throughput platforms using heterologous expression systems (CHO, HEK-293) now combine electrophysiological recordings with trafficking assays to accelerate variant classification. However, these models are limited by overexpression artifacts and absence of native protein partners. iPSC-derived cardiomyocytes provide a more physiological context but are resource-intensive and variable in their maturity and reproducibility. Inspired by therapeutic strategies for cystic fibrosis, two molecular approaches have been proposed to rescue hERG function: (1) pharmacological chaperones that promote correct folding and trafficking, and (2) channel activators that enhance ion conduction across the membrane. In this project, we will focus on a pore-domain specific hERG variant characterized with preserved gating and selectivity, but marked reduction in current. The variant is an ideal candidate to test suitable activators that can rescue the channel activity thereby restoring the cell excitability. Using complementary in silico, in vitro, and in vivo approaches, we will uncover the mechanisms of variant dysfunction, investigate the efficiency of known activators and identify new molecules acting as "potassium activators" aimed to restore cardiomyocyte excitability.	MODhERG – Molecular Modelling-Based Rescue of hERG Variants: from structure to in vitro and in vivo validation	**Olga ANDRINI** Université Claude Bernard Lyon 1, 69008 LYON	**Wendy GONZALEZ** Universidad de Talca, Talca

C25B04	The project aims to develop phototherapeutic drugs for cancer treatment, based on Antimicrobial Peptides (AMP) and Cell Penetrating Peptides (CPP) conjugated to a small singlet oxygen generator. There is a considerable number of AMPs, in addition to CPP that have been reported and proposed as potential candidates for generating new medicines for treating infectious diseases and as novel immunomodulatory therapies due to its phospholipid membrane interacting properties. Cancer cells have modifications of their membrane that can be exploited here by a well-adapted peptide that specifically perturbates membrane integrity. As perturbation or specific interactions may be not enough to induce lytic effect at small concentrations, the conjugation of these peptides with phototoxic dyes such eosin Y or Bengal rose will be envisioned for developing new candidates for photodynamic therapy for antimicrobial and cancer treatments. Thus, the project consists in the design of labelled specific AMP and CPP peptides with eosin Y and Bengal rose with high affinity for microbial- and cancer- membranes models and determine their activity as photosensitizers of singlet oxygen in biological models including evaluation of their ability for inhibit bacteria growth and phototoxicity and cancer cell lines with visible light irradiation.	Photosensitized Membrane-Targeting Peptides for Antimicrobial and Cancer Treatment	**Jean-Maurice MALLET** ENS département de chimie, 75000 Paris.	**Alexis ASPEE LAMAS** Universidad de Santiago, Santiago.
C25E01	The ALIEN0S project aims to elaborate on artificial intelligence (AI) and machine learning (ML) tools for optical nonlinear dynamical systems. Machine learning techniques have been employed to predict complex dynamics and extreme events, which are rare but extreme-intensity events. Their prediction is of significant importance in many areas, e.g., in weather forecasting, solar dynamics (solar storms), dynamics of oceans (rogue waves). AI and ML techniques can also be used to characterize, simulate and model complex systems using information compression techniques in artificial neural networks. In addition, optical systems can be a platform for studying the dynamics of complex networks used in AI and ML. The aims of ALIEN0S will be to use AI, ML tools nonlinear science tools to characterize, simulate and predict complex photonic systems, study photonic networks from a physical and dynamical perspectives, and use AI and ML as a measurement tool, which will be implemented in complementary experiments in Santiago (liquid crystals light valve), Palaiseau (semiconductor lasers) and Lille (fiber cavities), thus offering a real test bench for theoretical and numerical activities. Our team members bring extensive expertise in both theoretical and experimental research, ensuring a well-rounded approach to these challenges. In addition, this initiative will foster cooperation between the University of Chile, the University of Lille (PhLam/Ircica), and the Université Paris-Saclay (Center for Nanosciences and Nanotechnologies), promote the training of new generations of scientists and communicate towards both specialized and non-specialized audiences.	ArtificiaL IntelligencE for Nonlinear Optics Science (ALIENOS)	**Sylvain BARBAY** CNRS , 91120 Palaiseau,	**Marcel Garbriel CLERC GAVILAN** Universidad de Chile, MIRO

C25E02	The PIRE project explores an innovative strategy to enhance the ignition and combustion performance of aluminum powders by incorporating functionalized superparamagnetic iron oxide nanoparticles (Fe_3O_4@R). While aluminum is a leading candidate among metallic fuels due to its high oxidation enthalpy, availability, and low cost, its use is hindered by its native alumina shell, which raises ignition temperatures and impedes full combustion. To overcome these limitations, the project investigates hybrid reactive powders—termed AIRPs— composed of micron-sized aluminum particles (μAl) and nanoscale Fe_3O_4 particles functionalized with organic or organometallic groups (R). These functionalized nanoparticles act as catalysts, promoting aluminum oxidation and lowering ignition thresholds, while maintaining safety and scalability—critical limitations of conventional nano-aluminum powders. This French-Chilean collaborative initiative is structured around two main objectives: (1) experimentally confirm the improved ignition and combustion behavior of AIRPs compared to pure μAl powders, and (2) elucidate the fundamental reaction mechanisms at play when Fe_3O_4@R interacts with aluminum under thermal stimuli. The project deploys a comprehensive, multi-scale methodology combining synthesis and characterization of Fe_3O_4@R (e.g., TEM, FTIR, XRD, TGA), combustion testing using hot-plate ignition and high-speed imaging, thermal analysis (DSC), and in situ microscopy (EELS, STEM). Simulations using density functional theory (DFT) and reactive molecular dynamics (ReaxFF) support and interpret the experimental data by modeling nanoparticle decomposition, Al oxidation, and interfacial chemical processes. AIRPs will be systematically tested for ignition temperature, burn rate, and thermal behavior as a function of Fe_3O_4@R content and particle size. Through comparative analysis, the team aims to define structure–property relationships and optimize composition for desired energetic outputs. In parallel, theoretical studies will provide insight into surface functionalization stability, catalytic pathways, and the dynamic behavior of the Fe_3O_4@R/Al interface under thermal stress. These complementary approaches will offer a detailed picture of the ignition sequence and catalysis mechanisms, guiding the development of next-generation metalbased fuels. By integrating tailored nanocatalysts into aluminum-based powders, PIRE proposes a scalable and safer alternative to nano-aluminum, offering transformative potential for clean energy storage and release technologies. The project will also contribute to training early-career researchers through thesis projects and international exchange, reinforcing a bilateral partnership with strong scientific and educational impacts.	Pioneering Insights into the Reaction Enhancement of Aluminum Powders via incorporation of Functionalized nano-Fe_3O_4	**Carole ROSSI** CNRS LAAS, 31031 Toulouse cedex 4	**Cesar MORALES VERDEJO** Universidad Bernardo O'Higgins, Santiago
C25E03	This project aims to advance the fundamental understanding of acoustic and elastic wave propagation in fluid-saturated multiscale thermo-hygro-poroelastic media. These complex media consist of an elastic solid matrix with multiple pore networks characterised by distinct lengths, ranging from nanometres up to millimetres, and operate under normal or harsh conditions such as high temperature, humidity, and temperature gradients. They exhibit strongly coupled phenomena including multiscale fluid flow, heat and mass diffusion, fluidstructure interaction, and nanoscale sorption. Classical models such as Biot's theory fail to capture these phenomena. To address this gap, we systematically investigate three classes of increasingly complex media, namely multiscale thermo-poroelastic, multiscale hygro-poroelastic, and multiscale thermo-hygroporoelastic media subjected to temperature gradients. The project has three specific objectives: (i) to derive homogenised theoretical models that incorporate multiscale, multiphysics coupling via effective parameters; (ii) to analytically and numerically determine effective acoustic and elastic properties; and (iii) to experimentally validate the models using vibroacoustic testing. Beyond its scientific contributions, the project will provide formal means to develop a longterm collaboration between the four involved Chilean and French laboratories and will support the mobility and training of young researchers based in Chile and France, thereby providing them with valuable career development opportunities.	Wave propagation in multiscale thermo-hygro-poroelastic media	**Cécile GUIANVARC'H** Université Le Havre Normandie, LOMC UMR CNRS 6294), 76600 Le Havre.	**Rodolfo Gustavo VENEGAS CASTILLO** University Austral of Chile, Valdivia.

C25E04	Active solids—dense assemblies of self-propelled particles coupled via elastic interactions—exhibit complex collective behaviors far from equilibrium. While recent theoretical work has revealed the emergence of collective oscillations and global motion in such systems, key questions remain regarding the roles of synchronization, noise, and non-reciprocal interactions, as well as the emergence of phenomena such as wave propagation and orientation selection in collective motion. This project aims to explore the fundamental physics of active solids by combining minimal theoretical models, numerical simulations, and experimental realizations using vibrated agents embedded in elastic media. We will investigate analogies with synchronization transitions in the Kuramoto model, identifying conditions under which collective actuation in active solids may be interpreted as a generalized synchronization phenomenon. We will also explore whether non-reciprocal phase transitions and exceptional points can serve as mechanisms for chiral symmetry breaking in active actuation. Particular emphasis will be placed on understanding how noise influences the stability and onset of coordinated motion. The collaboration will integrate experimental expertise with ongoing theoretical developments, strengthen international research links, and contribute to the design of next-generation biomimetic or robotic materials with adaptive mechanical behavior.	Emergent Phenomena in Active Solids: A Story Far from Over	**Olivier DAUCHOT** ESPCI, PARIS.	**Gustavo DURING** Instituto de Fisica, PUC Santiago, Santiago.
C25E05	Ce projet se concentre sur la recherche de la production de paires de bosons de Higgs (HH) dans l'état final boosté bb□□ au Grand Collisionneur de Hadrons, en utilisant les données des Run 2 et Run 3 de l'expérience ATLAS. L'objectif est d'améliorer la sensibilité à la production de HH dans les régions cinématiques où les bosons de Higgs sont produits avec de grands boosts de Lorentz, et d'améliorer notre compréhension de l'auto-couplage de Higgs et de l'interaction quartique VVHH. En ciblant le canal de désintégration bb□□, qui a montré une forte sensibilité dans les analyses précédentes, et en l'explorant dans un régime boosté qui n'a jamais été analysé en précédence, ce projet vise à étendre le programme de physique actuel de l'expérience ATLAS. Une combinaison de ces résultats avec l'analyse à faible boost de Lorentz bb□□ et avec d'autres canaux de désintégration HH est envisagée pour maximiser la sensibilité. L'objectif expérimental du projet est le développement d'une nouvelle analyse HH→bb□□ boostée utilisant des taggers basés sur des transformer networks pour identifier les désintégrations du boson de Higgs boosté en paires de quarks b et de τ-leptons. Un accent particulier sera mis sur le mode de production par fusion de bosons vecteurs (VBF), caractérisé par des signatures de jet en avant. Le mode VBF donne un accès directe à l'interaction VVHH (avec V = W,Z). Le nouveau tagger ττ sera calibré sur les événements $Z \rightarrow \tau\tau +$ jets. Sur le plan théorique, le projet est motivé par le rôle du potentiel de Higgs en cosmologie et par la recherche de nouvelle physique. Des écarts par rapport au modèle standard dans l'auto-interaction du boson de Higgs ou dans la structure de doublet électrofaible seraient le signe d'une nouvelle physique dont les effets peuvent être modélisés par des opérateurs dand une théorie effective des champs. Ces déviations pourraient modifier la nature de la transition de phase électrofaible, la rendant fortement du premier ordre, une condition nécessaire pour des mécanismes tels que la baryogénèse électrofaible. Le projet envisage des scénarios spécifiques de physique au-delà du SM, tels que ceux impliquant des particules de type axion ou des scalaires supplémentaires couplés par un Higgs portal, et vise à interpréter les résultats expérimentaux dans ce contexte. Les principaux résultats du projet incluent une nouvelle analyse ATLAS sur la production bb□□ HH boostée en utilisant les données du Run 2 et du Run 3, une étude publique de calibration du tagger ττ, et un article théorique sur l'impact de ces résultats sur les modèles de brisure de symétrie électrofaible et la cosmologie de l'univers primordial. La collaboration entre les équipes françaises et chiliennes réunit l'expertise en matière de jet tagging et d'analyse de bb□□ boosté résonant du Run 2, et peut jeter les bases pour des efforts conjoints à long terme dans le domaine de la physique du boson de Higgs à haut boost de Lorents au LHC.	Exploring the High Energy structure of the vacuum through Higgs pair production at the LHC and first order phase transitions in the early universe	**Luca CADAMURO** CNRS, 91400 Orsay.	**Edson Leonardo CARQUIN LOPEZ** Universidad Técnica Federico Santa María, Valparaíso.

C25E06	Separating systems are combinatorial objects introduced by Rényi in the 1960s to encode distinguishable identifiers among elements of a finite set. In graphtheoretic settings, these systems gain structural richness when restricted to paths — leading to the notion of separating path systems. In this project, we study three closely related variants: edge-separating systems, vertex-separating systems, and S-separating systems, where S is a subset of the vertices and edges of a graph G. The central objective is to understand the minimum number of paths required to separate all pairs in S, under the constraint that each path must be a subgraph of the host graph G. We propose to investigate this problem along three interdependent lines: algorithmic complexity, cost-sensitive optimization, and structural characterization. From the algorithmic perspective, we aim to determine the computational complexity of deciding whether $spc(G, S) \leq k$, a problem which remains open even when $S = V(G)$ and G is a tree. In the optimization direction, we introduce a cost model over vertices and edges and study the complexity of finding separating-covering systems of optimal cost among those of minimum size. We extend this line to a resource augmentation model, where slightly larger systems are allowed and may reduce overall cost. Finally, on the structural side, we aim to identify global graph parameters — beyond classical local descriptors — that influence separation complexity, focusing on trees, cliques, and random graphs. The proposed research seeks to unify and extend recent developments in combinatorics and graph algorithms by providing structural insights, computational tools, and extremal bounds for separating systems. Through a combination of theoretical analysis and algorithm design, the project will advance our understanding of graph-based separation processes.	Separating Path systems: Algorithms, Resources, and Complexity (SPARC)	**Nicolas NISSE** INRIA, 06902, SOPHIA ANTIPOLIS.	**Christopher THRAVES CARO** Universidad de Concepción, Concepción.
C25E07	The rising global demand for copper is driven by population growth, technological advancements, and the transition to electromobility. As a Critical Raw Material (CRM), copper faces significant supply risks due to concentrated production in China and Chile, and traditional extraction methods often lead to environmental issues, notably Acid Mine Drainage (AMD). This project examines innovative approaches to copper extraction, with a focus on the desulfurization process in flotation, which aims to minimize sulfide waste and prevent AMD. Challenges in selectively separating collector-activated pyrite from copper sulfides underscore the need for a deeper understanding of adsorption mechanisms at mineral interfaces. The research utilizes advanced techniques, including ab initio molecular modeling and Density Functional Theory (DFT), to illuminate molecular interactions in flotation systems. Additionally, a multiscale bottom-up approach for optimizing flotation circuits is proposed, under the Solid withOut Sulfide (S.O.S) concept, aiming for cleaner production methods in mining. Collaborative efforts between the University of Lorraine and the University of Antofagasta are highlighting ongoing studies into integrated flotation circuits for polymetallic minerals, revealing opportunities to enhance mining profitability and sustainability. Overall, this research addresses critical global supply chain challenges in copper production, contributing to the sustainability of the mining industry.	Enhancing Metal Recovery Through Multiscale Analysis: From Molecular Modeling to Process Optimization in Copper Operation.	**Michael BADAWI** Université de Lorraine, L2CM	**Luis CISTERNAS** Université d'Antofagasta, Department of Chemical Engineering and Minerals Processing.

C25E08	A thorough understanding of the interfacial processes that govern the activity and selectivity of nickel-based electrocatalysts for anodic reactions such as the oxygen evolution reaction (OER) and ammonia oxidation reaction (AOR) is essential for advancing more efficient and sustainable energy technologies related to the green hydrogen production. This project aims to address this challenge through a comparative study of three catalytic platforms: (i) molecular systems (Ni-based Salen-type complexes), (ii) extended systems (Ni-based Hofmann-type coordination polymers), and (iii) nanostructured systems (Ninanoparticles embedded in a carbon matrix). We will evaluate how the structure, morphology, and surface reconstruction of the catalysts influence the preference for one reaction or the other. Molecular and extended systems allow fine-tuning of the electronic properties of the metal center via rational ligand design. This structural tunability provides an experimental platform to investigate how these properties influence the surface reconstruction into NiOOH active sites, as well as the formation of local pH gradients that modulate both catalytic activity and selectivity between the OER and AOR. The inclusion of nickel nanoparticles extends this research to systems with high technological applicability. These materials can be engineered to control their properties such as particle size, surface composition and metal-support interactions. The comparison of these three catalytic platforms is part of a comprehensive strategy that integrates multiple scales of structural complexity with in situ characterizations under operando conditions. This approach aims to establish robust mechanistic correlations between the electronic properties of the catalysts, surface reconstruction behavior, local pH effects, and catalytic selectivity. The insights gained from this work will contribute to the rational design of more efficient and selective electrocatalysts.	Unveiling the selectivity of energetic reactions through understanding their interfacial processes	**Carlos SANCHEZ-SANCHEZ** CNRS, LISE UMR 8235, 75005 Paris.	**Karina MUÑOZ-BECERRA** Universidad Bernardo O'Higgins, Santiago.
C25E09	In OPTIMA (Optimal Transport Innovations for Multidisciplinary Applications) we aim to develop and advance new Optimal Transport (OT) directions that have surfaced in recent years, with applications along three main axes: 1) Multimarginal transport and particle interactions: here the interactions between N particles are modelled by a coupling energy whose optimization extends the fundamental problem of OT (which corresponds to N=2), used in Computational Chemistry and Interacting Particle Systems problems. 2) Quantization problems involve finding discretization of mass distributions that optimize specific criteria. This varied class of problems, born in Signal Processing for error-correction purposes, can be formulated as minimizing the distance between a continuous and a N-atom discrete distribution. The questions we address are related to crystallization problems and material science, in the case of classical OT distances, and resource allocation within Branched Transport, in which the regularity of the interfaces is largely open. Further, studying the entropic regularization version of the quantization problem, which will allow us to get fast approximate algorithms on the numerical side. 3) Generative Deep Learning applications of OT: here the generated distribution that recovers input data is efficiently described through a geodesic in the space of probability measures, with respect to OT distances. To make algorithms more efficient, OT distance will be replaced by Sliced Wasserstein distances, which are faster to compute. However these methods have not been adapted to the most recent versions in which the probabilities are defined over categorical (i.e. discrete-valued) data. We plan to fill this gap, and in so doing establish new natural bridges between so-called vector-valued OT, Information Geometry, and Generative Deep Learning models based on diffusions and flows. The team includes researchers that have a strong track record on OT theory and applications, some with a long collaboration history, others that have recently started working together, and others that will interact for the first time, and we aim to cross-breed the different fields in which different researchers are experts in order to build novel approaches involving multiple team members.	Optimal Transport Innovations for Multidisciplinary Applications (OPTIMA)	**Paul PEGON** Université Paris-Dauphine, CEREMADE, 75116 PARIS.	**Mircea PETRACHE** Pontificia Católica Universidad de Chile,Providencia, Santiago.

C25E10	This project fits into the broad theme of coastal marine modeling, with a dual objective: to target and bring together both engineering applications and fundamental physics research. Experiments are being currently carried out in parallel in Chile and France, generating essential data sets for understanding some of these coastal processes. A particular focus is placed on enhancing statistical tools for extracting key parameters to support improved Computational Fluid Dynamics (CFD) schemes, especially in modelling Lagrangian transport of scalar quantities such as salinity. TIDE introduces a new axis of study, investigating the ecological and physical role of kelp forests in mitigating coastal erosion. Despite growing interest, limited quantitative understanding exists regarding how various kelp species influence sediment transport dynamics. Through a combination of hydrodynamic modeling, in situ measurements, and laboratory simulations, the project explores the capacity of long flexible fibers to act as natural wave and current dampers, promoting shoreline stabilization. This is achieved by bringing together two complementary approaches: a detailed understanding of the behaviour of fibers in turbulent flow (at the level of fundamental physics), and a macroscopic approach analyzing the impact of the presence of this flexible forest.	Project TIDE Transport by complex flows: Insights from Data, Experiments to coastal marine modelling	**Mireille BOSSY** Centre Inria d'Université Côte d'Azur, 06560 Valbonne.	**Héctor OLIVERO** CIMFAV – Facultad de Ingeniería Universidad de Valparaíso. Valparaíso
C25H01	Depuis 2018, le Chili et la France ont connu aussi bien des évolutions juridiques sur les violences de genre que des mobilisations féministes sur le sujet, sans que les processus d'appropriation du droit n'aient été encore étudiés comme élément constitutif et consécutif à la fois aux mobilisations. Parmi les contextes nationaux affectés par le mouvement international de lutte contre les violences de genre, la France a connu des mobilisations sectorielles suite à #MeToo en 2017, alors que le Chili a davantage été marqué par #NiUnaMenos, né en 2015 en Argentine, et par la temporalité de ses propres mouvements sociaux. Le mouvement féministe au Chili a connu une effervescence considérée comme historique en mai 2018 et a été portée par des étudiantes d'une vingtaine d'Universités tout au long du territoire national. La lecture des mobilisations et de l'évolution des institutions dans deux contextes où les chronologies sont proches, mais les mobilisations diverses, nous amène à problématiser les liens entre activismes et justice. Ces liens seront analysés non seulement autour des mobilisations sur les violences de genre dans les Universités, mais également plus largement des mobilisations sur les violences qui impliquent une appropriation du droit comme celles des « mères en lutte » et des luttes contre les violences sexuelles sur mineurs. Cela permettra de comparer transnationalement les usages du droit pénal, administratif (pour les Universités), constitutionnel dans le cas du processus constituant chilien. La question des usages ordinaires du droit n'a pas encore été réellement explorée pour l'intense période contemporaine de mobilisations pour la lutte contre les violences de genre: comment s'en saisissent les féministes, à la fois pour réformer le droit dans les institutions, et pour politiser et lutter au quotidien sur le sujet des violences? A rebours de l'idée reçue d'une mise à mal des règles de droit par les mobilisations féministes, nous visons à montrer comment dans le double contexte de politiques publiques marquée par la transversalisation de l'approche de genre, et par un fort mouvement féministe, le droit est investi comme un instrument pendant les mobilisations et au-delà. Il ne s'agira pas exclusivement d'étudier des mobilisations féministes sur l'arène juridique pour faire advenir de nouvelles lois, mais de s'intéresser à la manière dont certains aspects du droit, et pas seulement le droit pénal mais aussi le droit administratif et constitutionnel, ont été investis comme l'une des manières, parmi d'autres, de lutter contre les violences de genre; et comment la lutte sur ces violences s'est accompagnée, simultanément et a posteriori du déploiement des mobilisations, d'une appropriation du droit visant à réformer les institutions d'une part, le quotidien d'autre part. Le projet se déploiera en trois axes: un premier axe dédié aux Universités comme laboratoire des évolutions juridiques sur les violences de genre; un deuxième axe analysera les usages du droit par les militantes féministes; un troisième axe vise à se saisir des appropriations ordinaires du droit et des propositions alternatives telles que la justice restaurative.	S'approprier, réformer ou élaborer des alternatives au droit. Une analyse des luttes féministes contemporaines contre les violences de genre	**Viviane ALBENGA** Université de Tours, CITERES, 37000 Tours.	**Fabiola MIRANDA-PEREZ** Universidad de las Américas.

C25H02	Within the various colonial processes experienced in America from 1492 onwards, the role played by language, religion, and justice has been extensively addressed. However, fragmentation and specialization at the geographical,thematic, and disciplinary levels have prevented these three aspects of colonization from being brought into dialogue. In response to this, our collaborative and interdisciplinary project establishes the interrelationship between them, suggesting that the question of the languages of the Americas lies at the crossroads between political and social history, legal history, anthropology, missionary linguistics, and translation studies. Taking into account the importance of missionary work in the production of the textual bases for learning indigenous American languages through treatises and language arts, this project proposes that Christian literature influenced the translation of normative knowledge into the native languages of the Americas. In particular, our research will focus on the analysis of lexical resources used to express commands (deontic modality) in Mapuzugun, Guaraní, Maya, and Nahuatl languages during the 16th to 21st centuries. What influence have strategies for expressing the deontic modality used in Christian texts (sermonaries, confessionals, catechisms) had on the production of normative knowledge mobilized in legal texts such as ordinances for Indian villages, petitions or land titles, and international agreements drafted in these languages?	From the spiritual to the temporal : the influence of missionary linguistics on the translation of normative knowledge into the indigenous languages of the Americas (16th-21st centuries)	**Caroline CUNILL** Écoles des Hautes Études en Sciences Sociales, UMR 8168 Mondes Américains, 93300 SAINT-DENIS.	**Daniel Esteban ASTORGA-POBLETE** Universidad de La Serena, La Serena.
C25H03	Ce projet collaboratif réunit des équipes de recherche chiliennes et françaises afin d'examiner comment les entreprises de médias numériques natifs (DNM) gèrent les tensions sectorielles entre autonomie journalistique et soutenabilité économique. En nous appuyant sur des cadres de recherche complémentaires – l'équipe chilienne se concentrant sur l'habitus, les dispositions et les capitaux au sein des structures organisationnelles des DNM, et l'équipe française spécialisée dans l'analyse diachronique du cycle de vie des médias numériques natifs – nous proposons une approche comparative novatrice pour comprendre la soutenabilité des médias dans différents contextes réglementaires.	Field Dynamics and Sustainability in Digital Journalism : A Comparative Study of Business Model Innovation in Chilean and French Digital Native Media	**Nikos SMYRNAIOS** Université de Toulouse, 31077 Toulouse.	**René Eduardo JARA REYES** Université de Santiago.
C25S01	The search for reliable neurobiological markers of consciousness remains a central challenge in both basic and clinical neuroscience. Disorders of consciousness (DoC), including unresponsive wakefulness syndrome (UWS) and the minimally conscious state (MCS), highlight the limitations of current assessment tools—often based on cortical activity or behavioral responses— which may fail to detect covert awareness in non-responsive patients. This project aims to investigate distortion-product otoacoustic emissions (DPOAEs) as a novel subcortical signal of conscious state, grounded in auditory-brainstem physiology. DPOAEs are mechanical responses generated by outer hair cells in the cochlea, modulated by descending input from the auditory efferent system, including noradrenergic and cholinergic nuclei involved in arousal regulation. Recent evidence indicates that DPOAE amplitude tracks fluctuations in arousal and neurodegenerative processes, linked with brainstem auditory efferent system. These suggest that DPOAEs may provide a unique window into brainstem dynamics linked to consciousness, complementing traditional EEG and neuroimaging approaches. This Chile–France collaboration leverages the Universidad Adolfo Ibáñez's expertise in auditory neuromodulation and signal processing, and the Paris Brain Institute's (ICM) internationally recognized leadership in consciousness science and clinical research in DoC. The project will involve DPOAE recordings in patients with DoC at the Pitié-Salpêtrière Hospital (Paris), alongside high-density EEG and clinical characterization, to evaluate whether DPOAE dynamics can discriminate levels of residual consciousness. By combining physiological, computational, and clinical approaches, this study seeks to advance the mechanistic understanding of consciousness and brainstem function. The collaboration will foster bilateral training opportunities, co-supervision of students, and high-impact scientific outputs, establishing a platform for long-term joint research in consciousness science and neurosensory integration.	Otoacoustic Emissions as Biomarkers of Arousal in Patients with Disorders of Consciousness: A Chile-France Collaborative Study	**Jacobo Diego SITT** INSERM - Paris Brain Institute, PARIS.	**Vicente MEDEL** Universidad Adolfo Ibáñez, Santiago.

C25S02	In light of the global challenges related to food loss and waste, as well as the environmental impact of conventional plastic packaging, this collaborative research proposal between Chilean and French scientists aims to develop active packaging materials that can extend the shelf life of food products while being environmentally degradable without causing adverse effects after disposal. The project, titled EPIC-FP focuses on the design of novel, eco-friendly food packaging materials based on poly(lactic acid) (PLA), a compostable and bio-based polymer, and inclusion complexes (IC) of β-cyclodextrin (BCD) with essential oil derivative (EOd) as antimicrobial agents. Key activities will include the fabrication of active materials, their physicochemical characterization, in vitro evaluation of antimicrobial activity, release studies in food simulants, validation of effectiveness in a real food system, and disintegration and ecotoxicity assessments under composting conditions. These tasks will be carried out collaboratively in both Chile and France, involving postdoctoral researchers, graduate students, and the support of associated scientists.	Ecoactive Poly(lactic acid) films with Inclusion Complexes for Food Preservation	**Nasreddine BENBETTAIEB** Université de Bourgogne Europe, 21000 Dijon,	**Francisco RODRIGUEZ MERCADO** Universidad de Santiago de Chile, LABEN-CHILE, Santiago.
C25U01	Variable star research is about to undergo a revolution driven by two large surveys providing time-resolved observations: the Gaia mission of the European Space Agency and the LSST project of the Rubin Observatory in Chile. Gaia is expected to increase the number of variable stars from 10 million to more than 100 million by the end of 2026. LSST will further increase this number by providing access to the faint variable sky and surveying the variable star populations to larger distances. In addition, the Gaia space mission provides time-resolved spectroscopy (R=11500) thanks to the Radial Velocity Spectrometer on board of the satellite, allowing the derivation of the stellar chemo-physical parameters, including up to 12 individual chemical abundances. The goal of this project is to enhance the synergy between these two key projects of Galactic archaeology, to which our teams are highly committed, by improving the use of variable stars as reliable fossils of the Milky Way's assembly history. The French Gaia team of this project is responsible for the parametrization of Gaia RVS spectra and the Chilean team has important responsibilities in the Science Advisory Committee for LSST. The first stage of this project exploits the current (although limited) sample of variable stars with epoch spectroscopy in Gaia DR3. Specifically, we aim to test the validity and precision of atmospheric parameters obtained from Gaia RVS spectra of cool, long-period variables. A public DR3 spectra of a hundred thousand M-type stars, including variables and non variables, is already available. We will use this public dataset to validate the methodology for cool giants. At the end of the first year, the first LSST data will become public and the fourth catalogue of the Gaia mission will be released. Our goal is to perform an optimisation of the periodluminosity relations combining Gaia and LSST data. In year three, we will use the chemo-dynamical information gathered to trace and characterise stellar substructures in the Milky Way halo, the Large and Small MCs, and other satellites. This ECOS-Sud collaboration will enable our two teams to cooperate on the unique synergy of the Gaia and LSST projects, at a very high level of involvement for both parties.	From Andes to Alps: Unveiling the Galaxy with Gaia and LSST	**Alejandra RECIO-BLANCO** Observatoire de la Côte d'Azur, 06304 NICE Cedex 4.	**Márcio CATELAN** Pontificia Universidad Católica de Chile, Instituto de Astrofísica, Santiago.