



Call for proposals – 2021
Appel à projets vague 1

**EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (EXCELLENCES)**

TOOLS

Document de soumission / Submission form

Ce document devra **impérativement** comprendre un maximum de **25 pages, 3200 caractères espaces compris par page***, répartis à votre convenance entre ses différentes composantes, le corps du texte devant être en police de **taille 11 interligne 1,15**. Times New Roman ou équivalent. Tout document dépassant ce seuil sera considéré comme non recevable et restera hors concours. Il ne sera pas transmis au jury.

**décompte effectué avec l'outil « Statistiques » du logiciel Microsoft Word.*

Toutes les consignes écrites en violet sont à retirer en fin d'édition.

Acronyme du projet / Project acronym	TOOLS	
Project title (in English)	TransfOrming and Opening Learning and Sciences	
Titre du projet en français	Transformer et ouvrir les formations et la recherche	
Keywords / mots clés (min 5 – max 10)	Ouverture, Diversité, Recherche, Multidisciplinarité, International	
Responsable du projet / Project manager¹	Last Name, First name, Position, Organisation / Nom, Prénom, Statut, Organisation	
	École normale supérieure de Lyon Jean-François Pinton, Président	
	e-mail address / Courriel	Phone number / Téléphone
	president@ens-lyon.fr	0437376004

¹ Dans le cas où le projet est coordonné par deux responsables, remplir un encadré par responsable



Call for proposals – 2021
Appel à projets vague 1

**EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (EXCELLENCES)**

TOOLS

Document de soumission / *Submission form*

Établissement coordinateur / <i>Leading institution</i>	<i>Nom de l'établissement et statut</i> ENS de Lyon		
Partner institution(s) involved in the project / <i>Institution(s) partenaire(s) impliqué(es)</i>	Sciences Po Lyon Conservatoire National de Musique et de Danse de Lyon		
Project duration / <i>Durée du projet entre 72 mois et 120 mois</i>	120 mois		
Requested funding / <i>Aide demandée (minimum 5M€)</i>	67.4 M€	Full cost / <i>Coût complet</i>	331.6 M€
Le cas échéant : Listes des projets PIA auxquels ce projet est éventuellement lié (notamment EUR, universités européennes, Equipex, Labex, Institut convergence, IDEFI, etc.) / <i>Project links with existing PIA entities (e.g. EUR, Equipex, Labex, Institut convergence, IDEFI, etc.)</i>	<i>Acronyme du(des) projet(s), préciser le type de projet</i> 10 LABEX : Primes, Cortex, LIO, MiLyon, iMUST, Aslan, Celya, Comod, IMU, EcoFect 3 EQUIPEX : Biblissima, InfectioTron, SpatialCell3D 1 EUR : H2O 1 institut convergence : LUS IDEXLYON : 9 contrats IMPULSION, 2 contrats FELLOWSHIP, 4 contrats BREAKTHROUGH, 7 masters labélisés, 6 projets internationaux, 4 contrats élan ERC. 1 chaire industrielle, IFPEN : Road4Cat		
Ce projet s'inscrit-il dans le cadre d'une Initiative d'excellence labellisée IdEx ou ISITE ? Si oui, laquelle	Non		



Call for proposals – 2021
Appel à projets vague 1

**EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (EXCELLENCES)**

TOOLS

Document de soumission / Submission form

List of partner institutions / Liste des institutions partenaires

Renseigner une ligne par institution partenaire, ajouter autant de lignes que nécessaire.

Name of the research organisations / Nom des organismes de recherche	Legal status / Statut
CNRS – INRIA – INRAe - INSERM	EPST
Name of the institutions of higher education and research / Nom des établissements d'enseignement supérieur et de recherche	Legal status / Statut
Sciences Po Lyon	EPA
Conservatoire National de Musique et de Danse de Lyon	EPA
Name of the Clinical Entity / Nom des établissements hospitaliers (services, unités...)	Legal status / Statut
-	-
Name of secondary schools / Nom des établissements d'enseignement secondaire	Legal status / Statut
-	-
Other partners (Companies, Start-up, Associations, etc.) / Autres partenaires (Industries, Entreprises, Start-up, Associations, etc.)	Field(s) of activity / Secteur(s) d'activité
IFPEN	EPIC



Call for proposals – 2021
Appel à projets vague 1

**EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (EXCELLENCES)**

TOOLS

Document de soumission / Submission form

Sommaire / Table of contents

RESUME / SUMMARY	5
1 CONTEXT AND SCOPE OF THE PROJECT	7
1.1 AIM OF THE INITIATIVE	7
1.2 ADEQUATION WITH THE MISSIONS OF THE PARTNER INSTITUTIONS	7
1.2.1 Concerning the initiative towards diversity	7
1.2.2 Concerning the initiative towards a multidisciplinary approach	8
1.2.3 Concerning the international	9
1.2.4 Concerning the global policy of the partner institutions	9
1.2.5 Contribution of research organizations	10
1.2.6 Catalyzer effect of the project	10
1.3 INCLUSION IN THE DYNAMICS OF THE ACADEMIC SITE	11
1.4 INTERNATIONAL CONTEXT	11
2 PROJECT	13
2.1 SITUATION AND SYNERGIES	13
2.2 OPENING TO DIVERSITY	13
2.3 STRATEGIC PRIORITIES, RESEARCH CENTERS	15
2.3.1 Science of crises: from understanding to anticipation	16
2.3.2 Resources and Environment: Science for Resilience	17
2.3.3 Observations, data, concepts and modelling	19
2.3.4 Public Affairs - Towards a Lyon School of Public Affairs (LYSPA)	21
2.3.5 Cultural and Scientific Mediation	23
2.3.6 Adaptation of strategic priorities in training	25
2.4 INTERNATIONALIZATION	26
2.5 TRANSFORMATIONS INVOLVED	27
2.5.1 Contribution to helping society's transformations	27
2.5.2 Transformative dimension of the project's lines of action	27
3 MANAGEMENT AND PARTNERSHIPS	28
3.1 PRINCIPLES	28
3.2 ORGANIZATION OF DECISION MAKING	28
3.3 QUALITY AND MONITORING	29
3.4 FUNDS COMMITTED	30
3.5 OPENDATA AND IP	30
4 JUSTIFICATION OF MEANS	31



Call for proposals – 2021
Appel à projets vague 1

**EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (EXCELLENCES)**

TOOLS

Document de soumission / Submission form

RESUME / SUMMARY

Abstract - English version (max. 4000 characters)

The TOOLS initiative, **TransfOrming and Opening Learning and Sciences**, brings together the École normale supérieure de Lyon (ENS), Sciences Po Lyon (Sciences Po) and the Conservatoire National de Musique et de Danse de Lyon (CNSMD). These institutions have a major role in the training at the highest level of talented, motivated students who are aiming to become significant stakeholders and contributors to the academic, political and cultural action of France. The project, which aims at profoundly transforming the higher education and research landscape at local and national levels, is premised upon the following lines of action:

- **A desire to open up training programs to a more diverse student population.** In line with the reform of the French senior civil service, this approach is based on a proactive policy of open recruitment. To guarantee the success of this opening, given the advanced level of training in our institutions, material aid, in the form of study grants, is essential and an integral part of this project.
- **An initiative to better apprehend the major crisis experienced by our societies, and analyze the challenges and work out solutions in a multi- or even supra-disciplinary way.** Our institutions have the necessary knowledge, skills and resources to synergize all disciplines. This part is based on the work of multidisciplinary *Research Centers*, that operate as project incubators. It has a wide diversification in training, with the construction of distinctive courses. Our strategic priorities focus on (i) the need to develop a science of crisis, (ii) the global understanding of environmental issues, (iii) the modeling of phenomena, mechanisms at work and the prediction of trajectories; (iv) the importance of mediation and cultural approaches, (v) the reflection on public policies at all levels. ENS and Sciences Po combine social sciences and humanities as well as all sectors of the exact and experimental sciences. Together with the CNSMD we grant culture an essential role.
- **An international initiative, in a globalized academic world, the partner institutions need to connect to international centers worldwide.** In addition, both the opening to diversity and the multidisciplinary development of scientific approaches proposed here are a reality in leading institutions abroad. Attracting the best international students through a *PhD track* program is inspired by the US model. This initiative is accompanied (and structured) through a specific program of visiting professorships, international fellowships, and co-supervised theses. The project also includes provisions for increased outgoing mobility, already aimed at students and academics, and which we wish to extend to all staff.

The project is led by a Governing Council made of the 3 heads of the 3 partner institutions. This Council adopts the strategic guidelines, the monitoring processes, the criteria for evaluating the actions and the annual budget allocation, submitted annually to their Boards and Scientific Councils. Due to the social scope of the initiative, an annual report of the results obtained in terms of new openings and impact in research and training will be presented to all partners and authorities.

Led by ENS de Lyon, TOOLS brings together institutions that have a common work culture, similar practices due to their size and structure, with the necessary reactivity that allows for agile management of the project, sticking closely to the intended line of action.



Call for proposals – 2021
Appel à projets vague 1

EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (EXCELLENCES)

TOOLS

Document de soumission / Submission form

Résumé en français (max. 4000 caractères)

L'initiative TOOLS (TransfOrming and Opening Learning and Sciences) rassemble l'École normale supérieure de Lyon (ENS), Sciences Po Lyon (SciencesPo) et le Conservatoire National de Musique et de Danse de Lyon (CNSMD). Ces établissements ont un rôle majeur dans la formation, au plus haut niveau, d'étudiants, brillants, motivés et porteurs de projets professionnels les destinant à devenir des acteurs et contributeurs significatifs de l'action académique, politique et culturelle de notre pays. Le projet profondément transformant pour le paysage d'enseignement supérieur et de recherche aux niveaux local et national repose sur trois lignes directrices majeures :

- Une volonté d'ouvrir nos formations à une plus grande diversité des publics étudiants. Dans le sillage de la réforme de la haute fonction publique, cette démarche repose sur une politique volontariste de recrutement ouvert. Pour permettre la réussite de cette ouverture, compte tenu de l'exigence de nos formations, une aide matérielle, sous forme de bourses d'études est indispensable et partie intégrante de ce projet.

- Une ouverture afin de mieux appréhender les crises que traversent nos sociétés et d'analyser les défis, élaborer des solutions de manière multi- voire supra-disciplinaire. Nos établissements disposent des connaissances, des compétences et des ressources indispensables pour mobiliser en synergie toutes les disciplines. Ce volet repose sur l'action de Research Centers pluridisciplinaires dont le fonctionnement est celui d'hôtels à projets. Il a une déclinaison forte dans les formations avec la construction de parcours distinctifs. Nos axes stratégiques sont centrés sur : (i) la nécessité de développer une science des crises, (ii) la compréhension globale des enjeux environnementaux, (iii) la modélisation des phénomènes, des mécanismes à l'œuvre et la prédiction des trajectoires, (iv) l'importance des médiations et des démarches culturelles, (v) la réflexion sur les politiques publiques à tous les niveaux. L'ENS et Sciences Po conjuguent sciences sociales et sciences humaines aussi bien que tous les secteurs des sciences exactes et expérimentales. Avec le CNSMD, les enjeux culturels prennent une place essentielle pour penser nos sociétés.

- Une ouverture internationale : dans un monde globalisé les établissements partenaires doivent renforcer leurs liens avec leurs homologues internationaux. Par ailleurs, l'ouverture des formations à la diversité comme l'élaboration de démarches multidisciplinaires proposées sont déjà des priorités dans des établissements de premier plan à l'étranger. Comme cela se pratique aux États-Unis, notre ambition est d'attirer les meilleurs étudiants internationaux grâce à des parcours sélectifs de doctorat (PhD tracks). Ce volet est complété par un programme spécifique de chaires de professeurs invités, de bourses d'accueil de chercheurs et de thèses en co-tutelle. Le projet comprend également un volet de mobilité sortante, déjà proposé aux étudiants et aux chercheurs et enseignants-chercheurs, que nous souhaitons étendre en direction de tous les personnels.

Le projet est piloté par un Conseil qui rassemble les gouvernances des 3 établissements. Ce Conseil arrête les orientations stratégiques, les processus de suivi, les critères d'évaluation des actions et la répartition budgétaire annuelle soumis à leurs instances. En raison de la portée sociale de l'initiative, un rapport annuel des résultats obtenus en matière d'ouverture et d'impact en recherche et formation sera présenté aux tutelles et partenaires.

Conduite par l'ENS de Lyon, l'initiative TOOLS réunit des établissements unis par une culture de travail en commun, des pratiques proches en raison de leur taille et de leur structure, une réactivité nécessaire au management agile du projet afin de garantir le respect de ses lignes directrices.



Call for proposals – 2021
Appel à projets vague 1

**EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (EXCELLENCES)**

TOOLS

Document de soumission / Submission form

1 CONTEXT AND SCOPE OF THE PROJECT

1.1 AIM OF THE INITIATIVE

ENS de Lyon, Sciences Po Lyon and the CNSMD are characterized by their national ambition of training at the highest level of talented, motivated students with professional projects who are set to become significant stakeholders/contributors of the academic, political and cultural action of France. To fulfil the mission entrusted to them by the French State, several transformations are now necessary, in continuity with the developments led by the government, with “openness” being the key word.

- A desire to open up training programs to a more diverse student population. In line with the reform of the French senior civil service, this approach is based on a proactive policy of open recruitment that takes into account economic, social, geographical or gender biases. To ensure the success of this “opening up”, given the demands of training in our institutions, material aid, in the form of study grants, is essential. — for students who need to work while studying would find it challenging to follow our curricula.

- A more marked opening up of research onto the challenges of our changing societies is also required. Our institutions have the necessary knowledge, skills and resources to synergize all disciplines. This part is based on the work of multidisciplinary *Research Centers*, that operate as project incubators. It has a wide diversification in training, with the construction of distinctive courses. Our strategic priorities focus on (i) the need to develop a science of crisis, (ii) the global understanding of environmental issues, (iii) the modeling of phenomena, mechanisms at work and the prediction of trajectories; (iv) the importance of mediation and cultural approaches, (v) the reflection on public policies at all levels. ENS and Sciences Po combine social sciences and humanities as well as all sectors of the exact and experimental sciences. Together with the CNSMD we grant culture an essential role.

- An international opening, in a globalized academic world, the partner institutions need to connect to international centers worldwide. In addition, both the opening to diversity and the multidisciplinary development of scientific approaches proposed here are a reality in leading institutions abroad. The attractiveness of the best international students as part of a *PhD track* program is inspired by the US model. This initiative is accompanied (and structured) through a specific program of visiting professors and international fellowships for co-supervised theses. The project also includes an outgoing mobility element, a natural support for students and academics, which we wish to extend to all staff.

1.2 ADEQUATION WITH THE MISSIONS OF THE PARTNER INSTITUTIONS

1.2.1 Concerning the initiative towards diversity.

This section is based on the recognition that long and demanding studies require financial support, which is acknowledged by leading international institutions, where supporting high-level training is seen as being a service to the country as well as its political, academic, social and cultural sectors. This support is necessary in the long term and, in a context where the reproduction of elites is widely criticized, must aim to re-establish the principles of equal access to the most advanced training.

The decree creating ENS de Lyon stipulates that the School “*provides training of excellence to pupils and students going into the various professions of teaching and research in the European higher education and research area. It also contributes to the training, through research, of senior executives of the French and European administration and companies.*” Its 4-year training must be made accessible to the diversity of the nation, and our approaches must be profoundly multidirectional — to respond to the challenges that our societies are facing in a period of high complexity concerning the relationship between science and society. Recruitment at ENS de Lyon has two major components: the “normaliens-élèves” selected through a competitive entrance exam and, since 2017, the “normaliens-étudiants” selected based on their academic records. A measure to assist in the recruitment of normaliens-élèves from economically disadvantaged backgrounds has been requested by the ESRI Minister. The precise



modalities are being finalized. This project proposes to tackle the other recruitment pool, that of the “normaliens-étudiants” and will also make it possible to take into account additional dimensions of diversity, beyond the sole economic criterion. Financial support is therefore necessary to enable these students to follow the long and demanding training that our institutions provide; this support will take the form of a scholarship for all normaliens-étudiants, adjusted according to resources. This would be of course in addition to the grants based on social criteria given by the State.

Sciences Po Lyon is particularly oriented to training high-level civil servants to the stakes of a complex and globalized world. Its curricula are founded on the tools of social sciences, with a pluridisciplinary approach based on 4 main disciplines: political science, economics, law and history; communication being a secondary but also important discipline. In order to take account of the variety of social situations of students, a system of differential tuition fees has been introduced. A program to promote equal opportunities is particularly targeted at secondary schools in disadvantaged areas. Scholarships are provided to students, in particular as part of the compulsory international mobility of the 3rd year. The support of the PIA 4 will make it possible to award scholarships to students who join the second cycle of the course through the competitive entrance exam.

The CNSMD, which offers a five-year curriculum in music and dance with a choice of 90 different subjects, has the ambition to develop its diversity in arts, opening to aesthetics, cultures, practice and projects that go beyond its traditional scope and corpus. In doing so, a scholarship will help this opening to coincide with a larger diversity in applicants and, hence, selected students.

1.2.2 Concerning the initiative towards a multidisciplinary approach.

The second part of the project concerns the creation of multidisciplinary *Research Centers*, with five strategic priorities, at the heart of the challenges of our societies. These strategic priorities focus on (i) the need to develop a science of crisis, (ii) the global understanding of environmental issues, (iii) the modeling of phenomena, the mechanisms at work and the prediction of trajectories; (iv) the reflection on public policies at all levels, and (v) the importance of mediation and cultural approaches. These strategic priorities are naturally multidisciplinary and have long been approached as such in the best international institutions. The institutions brought together in the TOOLS initiative cover a multidisciplinary spectrum needed for the 360-degree approach required for modern challenges and, even more so, those to come. ENS de Lyon and Sciences Po Lyon combine social sciences and humanities as well as all sectors of the exact and experimental sciences. The CNSMD will provide the dimensions and cultural issues that have an essential role to play.

At ENS de Lyon, the training initiative that is associated with each of the 5 strategic priorities of the project will take place within the framework of its 4-year diploma, particularly adapted to build such training for these interfaces. In each of the five strategic areas of focus, training will be based on (i) multidisciplinary modules validated with tutored projects during the first year of the diploma (pre-master's), (ii) a choice of targeted courses during the following two years, in parallel with the disciplinary master's and (iii) will conclude with a fourth year specifically designed to bring together the students engaged in the specific objective concerned by offering them additional training, projects, and internships.

The curriculum of the Institutes of Political Studies is by definition multidisciplinary, the founding objective being to base the training of senior civil servants on a set of combined subjects (political science, history, economics, law). To this foundational multidisciplinary approach is added a Living Lab program requiring the transversal mobilization of this knowledge to analyze real-life cases and carry out proposals for actions and strategies. The TOOLS initiative would bring, through the LYSPA project of the School of Public Affairs, a type of intensive cross-cutting curriculum for the 4th and 5th year students.

For CNSMD, the cooperation with ENS de Lyon and Sciences Po Lyon will also bring new areas of competence for the next generations of graduates, in a combination of subjects that will be quite unique worldwide, grounding artistic training in research in humanities and social sciences. It is intended



Call for proposals – 2021
Appel à projets vague 1

**EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (EXCELLENCES)**

TOOLS

Document de soumission / Submission form

for future performers, creators, art directors which, given the variety of employment of CNSMD graduates will promote a new impulse in culture and mediation.

1.2.3 Concerning the international.

The attractiveness of the best international students within the framework of a *PhD track* Master-Doctorate program is inspired by the Anglo-Saxon model. The link between the two parts of the academic curriculum allows for an attractive offer. The quality of French life, and Lyon in particular (voted 2nd preferred city in France in the ranking of the magazine *L'étudiant*), the specific attention to onboarding and the individualized follow-up that our institutions provide, incite interest from students who wish to study a master's degree abroad. Retaining these doctoral students, given the international influence of this degree, will promote promotes the establishment of a network of decision-makers and officials with a global understanding of issues and cultures. This component is naturally based on the multiplicity of partnerships established today with high-level institutions, which share the characteristics of responsiveness and multidisciplinary approach of our institutions. It is accompanied by (and structured through) a specific program of visiting professors and doctoral scholarships for theses in joint supervision. The visiting professorships are intended to be multi-year (one stay per year for three years), with an investment in both research and training activities, on each of the strategic objectives of the project. This includes seminar courses and *master-classes* such as mediation/outreach schemes.

Conversely, the project includes provisions for outbound mobility. Student mobility is a requirement of the ENS de LYON Diploma (students spend 3 months to a year abroad) and the same applied to Sciences Po Lyon (in line with its diplomas related to areal studies in Europe, Asia, the Middle East, Latin America, Caribbean, the United States, Sub-Saharan Africa and Russia). The CNSMD has developed a wide array of collaborations, especially within Europe, which result in more frequent but less distant mobilities. These mobilities are naturally geared towards academics but we wish to open new mobility schemes to all staff from the three partner institutions. It is indeed crucial that all office staff can open up to international experiences. TOOLS thus includes provisions that extend and amplify the European Erasmus+ mobility program. Staff from the departments closest to academic activity (human resources, registrar, support for research) will be particularly encouraged to participate in these international mobility schemes.

1.2.4 Concerning the global policy of the partner institutions.

For ENS de Lyon, the project presented hereafter, and its various components set out above, are fully aligned with its own development objectives that result from discussions in the different communities in training and research and that have been approved by its decision-making bodies in April 2021. They have been transmitted to the HCERES and will be evaluated in its next five-year action plan (2021-2026). ENS de Lyon is thus fully committed to the realization of a transformative project, for which the funding of the PIA4 is in support of a proactive approach of openness and excellence, on the main fronts of academic activity: attraction of talented and motivated students, production of research at the service of society, in connection with the best international initiatives. ENS de Lyon obtained HSR4R labeling in 2019. It strongly supports international and multidisciplinary initiatives both financially through the mobilization of a Research Fund (€2 million/year, allocated by a scientific council composed of members mainly from outside the institution) and in terms of human resources with the granting of sabbatical leaves (16 semesters/year), preferably in support of early- or mid-career academics.

Through the LYSPA project included in TOOLS, Sciences Po Lyon intends to make a qualitative change by transforming its training and reconfiguring the training/research link, through the opening on the Lyon-Saint-Etienne site of a school of public affairs. This qualitative new step has been prepared for, in recent years, by the opening of the Public Factory (a Living lab of public policies), two Chairs, through the deployment of the Sciences Po Lyon Foundation and the opening of a strategic scientific focus on innovation in public action. From this point of view, TOOLS is closing this loop by



inscribing these innovations in the encompassing logic of a school of public affairs open to the structural transformations of public administration in France and to the growing imperatives of inclusion.

Similarly, the CNSMD will open its reflection on artistic training onto social issues and onto involvement in civil society thanks to a decisive grounding of artistic training in research in humanities and social sciences. In a pioneering move, the CNSMD aims at not only at fostering creation but at shifting its research focus on creation itself.

The involvement of the three institutions ensures an important societal impact, since it takes into account cultural aspects in the broadest sense, that is to say, including the dimensions of mediating knowledge with the public and in the adaptation in public policies at all levels — local, national and European.

1.2.5 Contribution of research organizations.

The contribution of research partners is essential to the success of the TOOLS initiative. Their involvement is detailed in each description of the proposed *Research Centers*. However, this is a contribution that is not limited to research for three reasons: (i) research and training are intimately linked in this project and researchers from the organizations are already directly and very significantly involved in training; (ii) to the extent that the aim is that of a national impact, their global vision is indispensable and (iii) the international aspect is naturally based on the major international networks to which these organizations belong.

1.2.6 Catalyzer effect of the project.

The partner institutions of the TOOLS initiative have, in their pool of influence, the capacity for a very significant impact on the characteristics and skills of those who will have special responsibilities in France and abroad, in the future. Therefore, the measures proposed in terms of openness must have the potential to significantly increase their social and cultural diversity, their awareness of the need for a global approach to the issues at stake, as well as their familiarity with the best international practices.

Because of their specific missions, the Ecoles normales supérieures, and of course ENS de Lyon, have a significant impact on the academic environment; many university presidents, heads of organizations, and academics have studied there. The same applies to academic executives, professors and lecturers, higher education institutions and research organizations. For example, during the CNRS recruitment in 2021, 30% of the candidates selected during the eligibility phase in sections 1 to 15 had completed part of their studies at ENS de Lyon. It should be noted that this impact is not limited to academic circles, because the careers of students from ENS de Lyon extend to the R&D structures of companies and to high state offices, in particular through shared curricula with the Institutes of Political Studies both in Paris and Lyon.

In general, the Institutes of Political Studies provide a significant proportion of political and administrative staff. The density of its alumni network shows the variety and importance of the recruitments that are made after graduation at Sciences Po Lyon, whether at the regional, national or international level, and their growing openness to NGOs and public-oriented private companies. Within the TOOLS initiative, the school of public affairs (LYSPA) will enable the creation of an outstanding center outside Paris, focused on the new trends in public affairs with the increasing role of local governments and administration in the framework of territorial governance, and with an accent on territorial inclusion. For ENS de Lyon, LYSPA will allow students with a career project in senior civil service to turn their research-based education into practical knowledge. On the basis of their disciplinary background, students will find a selective set of courses and activities during their 4-year curriculum in order to prepare their integration to the Prépa+ or other selective preparation to civil servants' examinations during the last year of their curriculum. In keeping with the current administration reforms in France where positions are specifically opened to doctors, LYSPA will contribute to train PhD holders to civil servants' competitive examinations.



The impact of the TOOLS initiative for the CNSMD is wide-ranging. Many graduates work in national orchestra or dance companies as performers, directors, or managers. The influence of a larger diversity of students will help open onto new aesthetics. Within the Master degrees CoPeCo (Contemporary Performance and Composition) and InMICS (International Music), the development of artistic curricula decisively grounded in research in humanities and social sciences will have a lasting impact in the sense that they will change the programs of these institutions as well as their relationships with society — as discussed over the recent Covid crisis.

1.3 INCLUSION IN THE DYNAMICS OF THE ACADEMIC SITE

The Lyon academic site is particularly active, with an important contribution in higher education and research. Within the site, the ENS, Science Po and the CNSMD are endowed with the specific mission of training students from all over the French national territory, and consequently for the national spin-off of their graduates. These national assignments are also linked to the territory within their networks of teacher training colleges, institutes of political studies and academies. The ENS, Science Po and the CNSMD thus contribute significantly to the influence of the site and maintain close relations with all the institutions of the ComUE University de Lyon.

In partnership with these local institutions, the ENS and Sciences Po have contributed to the response to numerous calls for tenders in training and research. ENS de Lyon, and Sciences Po for instance, have made several major contributions to the success of the site in the initiatives of PIA 1 to 3: with the LABEX MILYON, IMU, LIO, COMOD, iMUST, ASLAN, ECOFECT; with the convergence institute LUS; with EUR H2O; and more recently with the SFRI proposal (not yet arbitrated) within the IDEXLYON framework. These structures are now naturally called upon to contribute to the activity of the *Research Centers* of the TOOLS initiative. This is also the case for all the academics on the site: all can, if they wish, contribute to the training and research activity of the academic objectives of the TOOLS project.

IDEX: the ENS de Lyon played a major role in the IDEXLYON proposal within the framework of the PIA3, in particular regarding the importance of multidisciplinary approaches with the design and proposal of an integrated "science and humanities" division, whose relevance remains established today. The State's decision to put an end to the IDEXLYON project has led to a marked decline in the site's collective activities. The joint actions of the ComUE have been interrupted by lack of support from most of its members. In the absence of a joint initiative led by a ComUE that has been federating activities and coordinating synergies for more than 15 years, the partner institutions of the TOOLS initiative have focused on a contribution dedicated to the implementation of expected openings led by the State: diversity in the training of "elites", global approaches to the issues and inclusion in international practices. In the future, this initiative should be joined by engineering schools on the site.

To the best of our knowledge, this project is complementary to the LYNX project led by Lyon 1.

1.4 INTERNATIONAL CONTEXT

Several components of the TOOLS initiative are clearly benchmarked against the best standards of leading international institutions. All have a particular attention towards the diversity of students, in a very proactive way (*affirmative action*) in US institutions. In the same way, all of them implement financial support mechanisms for their most outstanding students. This often includes the form of moderate registration fees (known as *tuition waivers* in the United States), but also scholarships and it is within this framework that we would like to operate. The national culture and the specificities of the French ESR lead us to prefer directed aid to the quota system in force, in the USA, for example. *PhD-tracks* are, in one form or another, relatively common in American and Northern European universities.



Call for proposals – 2021
Appel à projets vague 1

**EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (EXCELLENCES)**

TOOLS

Document de soumission / Submission form

The benchmarking of the *Research Centers* and their themes against the best international standards is specified in part 2 describing the strategic priorities of the project.

ENS de Lyon cooperates with foreign institutions at various levels. A small number of strategic partners with specific joint academic programs, with resources are committed by both institutions. With East China Normal University in Shanghai, a very strong research program (<http://joriss.ens-lyon.fr/>) has been developed, through a joint training of selected ECNU Master students followed by joint cotutelle PhD program a PhD-Track (PROSFER) that has now trained over 100 PhDs making it the largest bilateral Franco-Chinese doctoral program. In India, the initiatives with the Indian Institutes for Science, Education and Research (IISER) network and the French ENS are based on research & training with a common will to contribute together in fields such as education, sustainable development, climate issues and global health. The partnership is also part of a bilateral agreement, started 5 years ago. Due to the large number of research networks operated at international level, very strong cooperation is also developed in Canada (with a joint bureau with CNRS and University of Ottawa), in Japan (University of Tokyo, Tohoku University, National Institute of Informatics), the United States (Northwestern University, Columbia, Boston University, Johns Hopkins, Berkeley, Maryland, Princeton). In Europe, there is range of double Master programs with leading institutions such as EPFL, Cambridge, or University of Freiburg.

At Sciences Po, mobile students, whether inbound or outbound, are mentored by a specialist of area they are travelling to and they can also rely on the support from our dedicated mobility team (both for the Erasmus+ program and for mobilities outside Europe). In this diversifying field, Sciences Po has launched dual degrees programs with the Hong Kong Baptist University, and with Loughborough University (UK). A similar scheme is being discussed with the Batten School of leadership (University of Virginia, USA). Ultimately, the goal is to offer dual degrees with partner institutions worldwide.

Internationalization is of course at the heart of CNSMD academic life, due to the importance of masterclasses and collaborations at international level (<http://www.cnsmd-lyon.fr/fr-2/international/etablisements-partenaires>). Among them, works with Taipeh Nat'l University of Arts in Taiwan, with Beijing Normal University (particularly concerning the teaching of dance) and growing ties with arts schools in Mali and Benin are of prime importance.

In terms of outreach/visibility, ENS de Lyon is in the top 5 French higher-education institutions in the rankings where the indicators are not based on size — which is the case of the Times Higher Education (THE) and Quacquarelli-Symonds (QS) rankings, for example. In 2021, ENS de Lyon holds the 130th place in the QS world ranking.

It should be noted, however, that this proposal is not geared towards optimizing international rankings. Its priority is that of changing practices in the national landscape of higher education and research, and its impacts on society, with transformative openings in terms of diversity and multidisciplinary approaches. In terms of attractiveness, the ENS, Science Po and the CNSMD are constantly seeing an increase in the number of applications received — + 20% at the ENS over the past years, +45% in common competitive entrance exam of IEP between 2020 and 2021, for example. The questions of influence and visibility are raised here in terms of inclusion in international practices for which we are now lagging behind: encouraging diversity of students for high-level training, in the implementation of research and training approaches that go beyond disciplinary segmentations.



Call for proposals – 2021
Appel à projets vague 1

**EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (EXCELLENCES)**

TOOLS

Document de soumission / Submission form

2 PROJECT

2.1 SITUATION AND SYNERGIES

The partner institutions are closely interconnected. Within the CHEL[s] framework (www.chels.fr), we operate jointly open seminars, multidisciplinary courses, MOOCs, junior labs, etc. They are all inspired by the original picture that can emerge from looking at ordinary topics from the standpoint of different institutions, disciplines and professional bias. Examples range from “emotions” (a MOOC), “decision” (a set of lectures) to “worldwide women” (a junior lab). Since 2013, the mixing of students and faculties in this context has proved quite attractive for our students showing the potential of an increase in our collaborations.

On a more traditional academic side, ENS de Lyon and Sciences Po Lyon share several research labs (Triangle “action discours et pensée politique et économique”, IAU “institute d’asie orientale»), laboratoires d’excellence (the LABEX “Construction de la Modernité” and “Institut des Mondes Urbains”) and several Masters’ degree (“asioc” and “alter-europe”, for instance). They also select some students through a common national competition. ENS de Lyon and Sciences Po have also created the PREPA+ track. PREPA+ is particularly relevant in the context of the TOOLS initiative, since it aims at preparing student for senior civil service exams both at regional and national levels. Supported by the territorial dynamics of the Auvergne-Rhône-Alpes region, its development in Lyon is in line with “decentralization” efforts promoted by the French government.

In addition to the existing collaborations mentioned above, ENS, Sciences Po and the CNSMD are mainly connected by all cultural characteristics of academic life of “grandes écoles” as “human-sized” institutions. Students are mentored individually, with curricula that are essentially tailor-based. Our administration has a high degree of proximity, reactivity for teaching or research activities; in particular extended support is given for the preparation of answers to project calls at national or international level. It is also the case of all levels of governance: the directors of these institutions as well as their academic deputies are in daily contact with teaching and research structures.

2.2 OPENING TO DIVERSITY

Current state concerning recruitment on the national territory

At ENS de Lyon, “normaliens-élèves” are recruited through the post-CPGE competitive entrance exam, and specific measures are now being studied to help the most economically disadvantaged candidates. “normaliens-étudiants” are not recruited on the basis of a competitive entrance exam but are selected on the basis of their academic records. One of the goals that motivates this new alternative access is the opening up towards talents who would not have followed the “canonical” CPGE training. This is not yet the case; today, half of them still come from preparatory classes — and often from those which provide the majority of admissions annually. This situation reinforces a pattern of “reproduction of elites”, often criticized. This is also the case at Sciences Po Lyon. The need to increase attractiveness from outside the traditional framework is therefore well established, with differences according to disciplines and professional opportunities.

Reasons and recommendations

The observation previously developed at a national level in France by the strategic committee “social and territorial diversity in higher education” led by Martin Hirsch. The motivations underlying the proposals in this project thus focus on working along two main objectives: tackling all kinds of diversity, and supporting success in higher education. It is therefore a question of contributing through various mechanisms to “*disperse excellence on our territory (in compliance) with the rules of equity and equality in relation to competitions*”(Frédérique Vidal) and to mitigate the cultural gap that some students in prestigious Higher Education Institutions. Encouraging these young people in their career path will therefore help to erase the impact of social disparities in their successful university careers. In addition,



tackling the mechanisms of social reproduction will strengthen the role of our schools in terms of democratization and equal opportunities. This reflection is part of a movement that has already begun. Studies on the sociology of education (Allouch-Baker, 2017) questions the relevance of recruitment in these prestigious schools and their reproductive effect. In this perspective, the recent work of Agnès Van Zanten, sociologist and research director at the CNRS, proposes an analysis of the diversification of access to selective higher education. Various measures are deployed and encouraged at a national level (CPES, agreements linked to priority education, reform of the senior civil service, etc.) and it is up to the "prestigious" institutions to fully participate in this movement.

Criteria envisaged and implementation. Among the criteria to be taken into account to increase the diversity of recruitment and reduce the impact of social and territorial determinisms on their access to training of excellence are:

- the academic background with, on the one hand, the institution where the secondary school diploma (Baccalauréat) was obtained and the specialties chosen at "Baccalauréat" level, and on the other hand, the post-baccalaureate studies (identified by the institution and the training). This type of attention can help to restore "geographical" equality in the national territory.
- the social background of the candidates, in particular the family environment, taking into account the parents' occupation and their level of education. Encouraging "first timers", i.e., students whose parents have not studied in higher education, will help to re-establish social equality, one of the historic missions of the Grandes Ecoles in France.
- remediation of biases that undermine equality. It is also an impact in terms of objective effectiveness. For example, gender studies have amply demonstrated the effects and costs of excluding women from the scientific field.

At ENS de Lyon, the implementation of these criteria will have an impact on the selection procedure of candidates. One possibility is to proceed to a selection in two stages with a preselection of admissible files, followed by an oral. This step also offers candidates the opportunity to highlight their motivation and the advancement of their project. At Sciences Po, students entering in fourth year of the 2nd cycle have to take an oral which could again be transformed by the opening. As far as the CNSMD is concerned, its selection process relies on technical exams which could also be transformed and favorably altered by this new opening.

The proposed system of opening can be put in place as soon as the project is accepted with the reception of a first batch of students recruited through this new system, from the beginning of the 2022 academic year. It is expected that this first wave of recruitments will really positively promote this scheme.

Other specific measures

Specific measures have been proposed along three lines: (i). informing and guiding students towards an application, (ii) supporting them during their schooling at ENS and (iii) ensuring better access to the diversity of opportunities. Upstream, taking into account the diversity of potential applications and the expected developments in recruitment must be backed by an ambitious communication policy, in secondary schools, in all university courses and of course on social media. For students who are currently studying in one of our Schools, are our best ambassadors, and they must be full participants to this campaign. This will deter against self-censorship and the belief that anyone living in "social housing" may not apply for these studies. Targeted tutoring will also systematically support students preparing their applications. While at the ENS de Lyon, students will benefit from tutorials to boost their confidence and autonomy. We want to provide the right conditions for successful studies and facilitate the integration of students who could feel "alien to the system" and isolated by creating inclusive working conditions through collective workplaces with pedagogical support. Finally, specific help will be given when they have completed their studies, to help them find jobs.



2.3 STRATEGIC PRIORITIES, RESEARCH CENTERS.

To guarantee the success of transformation in training and research activities, we have chosen to rely on existing concepts in three partner institutions, in an extensive way, in training or in research, and to seize the opportunity of this call for proposals to expand them. Beyond excellence in their own discipline, this transformation must open up academics to multidisciplinary approaches and to societal issues. This approach has led us to identify five main strategic priorities:

1. Science of Crisis: From Understanding to Anticipation
2. Resources and Environment: Science for Resilience
3. Observations, Data, Concepts and Modelling
4. Public Affairs - Towards a Lyon School of Public Affairs
5. Cultural and Scientific Mediation

For each strategic priority, we will describe below its aim and give examples of inspiring international models. Once the associated context has been defined, we will highlight our scientific strengths that could rely on one or on all of the three partner institutions. We mention briefly the key international partners on the underlying questions, before discussing the main research themes and the expected impact on the training of our students. Fostering interdisciplinary approaches shall benefit students and young scientists but also offer the possibility of life-long training for academic staff. Note that of course, the themes will not cover all the research conducted in the labs and do not replace the bottom-up process, which remains an essential drive for knowledge emergence.

The five proposed priorities combine, in different proportions, themes or major issues (environment, crises, public affairs, culture, etc.), methods or approaches (modeling), and finally, purposes (fundamental research, training of decision makers or experts, etc.). All of them are characterized by a commitment to multidisciplinary approaches: a sort of cross-fertilization and cultivation, an intermeshing of the natural and social sciences, humanities, culture and the arts. All of them attempt to combine research and training in an original way. They also harbor the ambition to bring the findings and benefits of their work to a variety of audiences, both within and beyond the academic world.

Modelling is key to understanding resources and environment issues, and will undoubtedly play a role in the study of crises; the latter two topics should be central in the training of decision-makers; mediation is important for resources and the environment to follow the changes in populations, etc. In short, each priority is already intrinsically multidisciplinary, however, there is a second level of interaction between the inter-points of cooperation that seems promising.

More fundamentally, the combination of these five priorities aims at a new understanding of the complexity that characterizes contemporary reality, which is in a state of constant flux and where the old boundaries, notably disciplinary boundaries, are subject to fundamental questioning, appearing less and less obvious or justifiable, and may not even be relevant anymore. It is therefore urgent to: (i) understand the current of the general upheavals arising in society, economics, politics, and thought in all its disciplinary forms; (ii) investigate by identifying present impasses and dangers, but also possibilities and opportunities; (iii) act creatively and inclusively in the face of these situations, transforming crises into opportunities for improvement and hope.

Yearly calls for proposals will be organized. Scientific projects covered by each *Research Center* will be selected following the approval of the steering committee. Invited professors (for a period of 3 months or a one-month invitation, three years in a row), internship gratification for undergraduate, PhD thesis and post-doc positions will be the other tools to guide the faculty of ENS de Lyon, Science Po Lyon and CNSMD in this discovery of uncharted scientific territories.

National research organizations (CNRS, INRAé, INRIA, INSERM) constitute a very important contribution to the research potential and influence of ENS de Lyon, in particular thanks to the large number of staff (researchers, engineers, technicians, administrative staff) who are assigned to the units. The implementation in recent years of a scientific, human resources and financial policy, designed to be



Call for proposals – 2021
Appel à projets vague 1

**EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (EXCELLENCES)**

TOOLS

Document de soumission / Submission form

as collaborative as possible and over as many years as possible, is particularly suited to our way of working. All themes that will be studied in the different *Research Centers* will resonate with the challenges mentioned in one or several of their recently published Contracts of objectives and performance (COP).

2.3.1 Science of crises: from understanding to anticipation

Ambition and models

Recent crises have grown in complexity, highlighting the need to better understand their causes and interconnections. Our ambition is to create a holistic science of crises programs where societal change and crises are not only understood through the lenses of philosophy and historical comparisons, but analyzed and evaluated through rigorous quantitative, predictive frameworks inspired by scientific disciplines.

This initiative is in line with other international research groups, such as the Pearson Institute for the Study and Resolution of Global Conflicts at the University of Chicago in the US (<https://thepearsoninstitute.org>), the Centre for Crisis Study and Mitigation at the University of Manchester (<https://www.crisis-studies.manchester.ac.uk>), and the Wuppertal Institute in Germany (<https://wupperinst.org>).

Context

Conceptualizing changes is at the core of social and human sciences. These sciences construct frameworks for understanding the conditions and social consequences of the causes of change, ranging from demographic shifts to ecological and technological transformations and ideological revolutions. By studying the history of the modus of change, such as the rises and falls of empires, revolutions, and philosophical quarrels between the 'Moderns' and the 'Ancients', the social sciences have already laid strong foundations for an interdisciplinary study of crises. While crises are often thought of as moments of urgency and despair, they also present an opportunity to envision alternative futures and conceive paradigm shifts. Here, the historical study of past crises resolutions paired with innovative and robust data analysis can help devise implementable solutions to present and future problems.

Anticipating and guiding new possible organizations of future societies also requires understanding and quantifying the specific contemporary opportunities and constraints through interdisciplinary studies. For example, thinking about solutions to the democratic crises requires a good understanding of their underlying drivers and mechanisms. If income and wealth inequalities have been on the rise in most Western societies over the last decades, one of the key drivers of the decrease in tax consent seems to be the increasing gap between measured and perceived inequalities in a context of growing populism. Precisely documenting the evolution of inequalities and citizen's perceptions, measuring the effect of tax scandals on the acceptability of taxes and various policy measures would help design solutions to overcome the crisis of the democratic governance. Thinking about solutions for the environmental crisis requires a good understanding of the impact of climate change on migration and geopolitical crises, of the economic constraints raised by a rapid convergence towards a greener economy, in addition to the political, social and scientific innovations required to foster rapid changes. This illustrates the interplay between various contemporaneous crises and the need to address them within a common framework, building on the research expertise of research laboratories in complementary subjects, often kept separate from one another.

Scientific strengths and international partners

Our ambition is to build on synergistic skills in the academic community to contribute to the interdisciplinary field of crisis studies, by better identifying, measuring and understanding complex drivers and mechanisms, thanks to collaboration between experts from a broad range of disciplines. Natural links with the *Research Center* on modelization are expected.

Research laboratories have established expertise in the transdisciplinary study of changes, addressed at various periods of time (antiquity, medieval, modern, and contemporary times), for specific



Call for proposals – 2021
Appel à projets vague 1

**EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (EXCELLENCES)**

TOOLS

Document de soumission / Submission form

geographical and cultural areas such as the Mediterranean World, Europe, Africa or Asia, and from the perspectives of humanities, social and experimental sciences. Previous research on democratic governance and conflicts in a globalized world, migration and circulation, education, genders, secularism, digital mutations, earth and climate change issues, energy transition, sustainable technologies, has been carried out within numerous research laboratories.

All humanities labs from ENS and Sciences Po will be involved (CIHAM, COMOD, CMW, ELICO, EVS, GATE, HISOMA, IAO, ICAR, IHRIM, LARHRA, TRIANGLE) and several pure or applied sciences ENS labs (UMPA, LCH, LIP, LPENSL), will provide solid foundations for the new *Research Center*. In addition, it will benefit from established collaboration with leading international research centers, such as UC Berkeley's department of economics and the EU funded European Tax Observatory, the Pearson Institute for the Study of Global Conflicts at the University of Chicago and Princeton University's Climate Futures Initiative in Science, Values, and Policies (CFI).

Main Research Themes and impact on training

The center will explore normative and positive approaches, with considerable attention to crises in their democratic, economic, ecological or social (gender, migrations ...) dimensions.

A first work package will be devoted to the analysis of the main drivers of past and present crises. Particular attention will be paid to the identification and measurement of these drivers, using historiography, econometric techniques and machine learning. A second work package will focus on how previous crises were overcome. Using the tools of comparative analysis, we will investigate the role of scientific and technical innovations, shifts in social representations and public policies. We will examine which solutions were experimented, in which precise context, and with which degree of success or limitations? A third work package will aim to develop solutions and policy recommendations that could help face present and future crises, on the one hand, and anticipate future crises, on the other hand. As an example, we will build on the first two work packages to construct models capturing key social, economic and ecological mutations.

From the disciplines of the humanities and social to economics, as well as involving methods spanning theoretical approaches to natural sciences (geo-physics, computer science), the center will articulate, analyze, frame, and – most importantly – devise strategies, ways of engagement, and of governing that address the root causes of crisis and diminish future societal risks in a manner that is democratic, fair, and inclusive. Through this initiative, Sciences Po Lyon and ENS de Lyon's research laboratories will help students but also citizens and policy makers face an increasingly volatile and uncertain world.

2.3.2 Resources and Environment: Science for Resilience

Ambition and models

This initiative tackles the question of our new relationship with resources in a fluctuating and degraded environment. Resilience, or our ability to adapt over the long term, has become the main challenge of the 21st century and is also leading to a revolution in the way research is done and knowledge is shared. Prompted by this statement, the priority promotes transdisciplinary research, i.e., science with citizens. The goal is to understand how the nexus between planetary and situated knowledges can create robust and local solutions to global challenges.

This initiative is in line with other recent developments at an international level, such as the Rockefeller Foundation Economic Council on Planetary Health (www.planetaryhealth.ox.ac.uk) at Oxford university (albeit with a bias towards economy), the Research Institute for Humanity and Nature in Kyoto (www.chikyu.ac.jp) or the upcoming creation of the first interdisciplinary Max Planck center with a focus on the Anthropocene in Berlin.



Context

In addition to the well-documented climate crisis, several environmental challenges can be evoked: (i) the upcoming shortage of resources (in 2015, the National Alliance for the Coordination of Energy Research estimated that to satisfy human needs until 2050, Humanity would have to extract as many minerals from the subsoil as it has done since its origins); (ii) educate on the effects of and reduce massive pollution (9 million premature deaths due to air pollution every year, according to WHO); (iii) interrupt geochemical and geophysical cycles (synthetic nitrogen fertilizers derived from the Haber process, which transforms atmospheric nitrogen into ammonium, and feeds 50% of the world's population); (iv) deal with a worldwide increase of human-induced geohazards linked with mineral and water resource shortages (e.g. large-scale groundwater and mining extraction produces stress changes, alter seismicity and induces land subsidence impacting large cities); and (v) witness a biodiversity collapse, with the risk of losing ecosystem services with a value that exceeds the world's GDP.

Beyond the prediction of environmental impacts, several social parameters are likely to deteriorate, notably the health of populations, and there will also be increased migration, conflict and political instability. The aim of the academic system is to face this new situation with the goal of creating a viable third way, thanks to (i) a better understanding of the geophysical, geochemical, biological, economic and social mechanisms involved, together with their systemic interactions and emergent properties; (ii) the development of technological solutions, but also considering a critical analysis of the associated feedback (i.e. moving beyond the sole Sustainable Development Goals framework developed by the UN); (iii) the training and education of a new generation of stakeholders able to co-construct resilient and situated solutions with citizens.

Scientific strengths and international partners

The program builds on new interactions between ENS research laboratories, with shared issues at the forefront rather than specific lab expertise: RDP (plant-based solutions), EVS (hydrology), LGL (geomodelling), LCH (green chemistry), LPENSL (climate physics), UMPA (mathematical modeling), TRIANGLE (political science), GATE (economics) with a large involvement of all teaching departments and IFE (education for school teachers). Moreover, the project benefits from local interdisciplinary centers such as the Complex Systems Institute (www.ixxi.fr), the Institute of Mathematics for Planet Earth (impt.math.cnrs.fr) and the Michel Serres Institute (institutmichelserres.fr).

Training is closely linked to international stakeholders for its research and training, and more specifically on the topic of resources and environment (Anthropocene Curriculum in Berlin, RIHN Kyoto, SRC Stockholm, UN, etc.). For instance, Lyon's positioning as a biomedical capital of the world (notably with two WHO centers and prominent companies in the sector (bioMérieux, Sanofi...), opens the door to the planetary health dimension, i.e., preventive health through food and ecosystem monitoring.

Main themes of research and impact on training

The project is articulated around the triptych: diagnosis, solutions, prevention. Diagnosis through a comprehensive description of the environmental crisis and the understanding of its effects on our societies is the cornerstone for the implementation of technologies and public policies that are (i) able to remedy and prevent; (ii) understandable; and (iii) acceptable by and co-created with citizens. For instance, the crucial use of renewable energy resources (wind, tide, solar...) cannot be dissociated from the issues related to the (digital) management of networks, intermittent flows and storage. To tackle this, this priority will bring together LPENSL (research on extreme climates and renewables) with IXXI (geopolitics of the digital economy). The associated mineral use requires new strategies on solubilization for extraction that are less impactful for the environment, especially through the use of green chemistry and more resource and atomic efficient processes. This calls for new synergies between LGL (geology) and LCH (chemistry). The development of a circular bio-economy requires new developments in



biotechnologies, physics and chemistry, while also mapping our ecosystems and predicting their trajectories. This can build on the expertise in natural capital evaluation (Michel Serres Institute) and plant-based solutions (RDP, LCH).

Lastly, if science embraces adaptability as the new compass towards progress and modernity (instead of just efficacy and efficiency), then research and training will need to develop new ties with citizens, to ensure the robustness of situated solutions. Several projects have already been initiated (e.g., on the systemic implications of switching from wheat to spelt with local farmers, nutritionists, and chefs). Because such developments involve the collection and management of massive amounts of data, which are much more heterogeneous and variable than data in controlled lab environments, the development of citizen science is also a revolution in education and research in all fields, from pure mathematics, data science and biology to geography and sociology. In close collaboration with the Lyon metropolitan area, the city of Lyon, and local associations outside the academic framework, we will create a project incubation hub, "*la fabrique de la résilience*". For instance, a project on food resilience involves a new generation of seed farms that support the farmers' autonomy, increase biodiversity in terms of what is cultivated and the food that we eat, and use food as a lever for preventive health, also in line with the gastronomy tag of the city. The hub will be a place to share questions between academics, citizens and decision-makers, and a place to learn and experiment action-research. On both sides of the design of public policies associated with resilience and citizen participation to solving environmental and resource problems, Sciences Po Lyon will be a key partner along with ENS de Lyon, notably through its Public Factory "Living lab" and its Chair on Innovation in public action, whose focus is notably on sustainability and participation.

The solid scientific experience gained over the years as well as the ties with prominent global players and local stakeholders, make the partners institutions the perfect candidate to become an agile transdisciplinary player on the environmental challenges related to resources, with the goal of becoming a world leader on science for resilience.

2.3.3 Observations, data, concepts and modelling

Ambition and models

At the core of this proposal is the creation of an interdisciplinary structure hosting projects in which the modelling stage is key and concerns almost exclusively ENS de Lyon. Deeply rooted in the concepts and methods of hard sciences, the innovation of the project is to create actual and tangible transdisciplinary scientific solutions to challenges via strong and intertwined collaborations between natural and social sciences, within our institutions and with our partners, industry and society at large.

This initiative is in line with other recent developments at the international level, such as the Warwick Centre for Predictive Modelling (warwick.ac.uk/fac/sci/wcpm/), which associate teaching structures and a research center applying modelization techniques to both natural and social sciences. Other institutes have been put forward to gather mathematicians, computer scientists, physicists and/or biologists; such as the Institute of Systems Biology at Seattle (isbscience.org), the Lewis Sigler Institute at Princeton University (lsi.princeton.edu), the RIKEN Center for Biosystems Dynamics Research in Japan (www.riken.jp) or BioQuant at Heidelberg University (www.bioquant.uni-heidelberg.de).

Context

Many research activities today are aiming at understanding the principles underlying life and evolution, the transformation of languages, or multilayered realities of an urban environment, ... to name just a few examples of modelization. To fully understand nature and societies and develop predictive approaches, sciences need to articulate classical descriptive practices with quantitative and multi-scale approaches connecting several different fields of sciences.

Data massification together with the recent development of data collection and curation processes testify that scientific activity is already undergoing an in-depth transformation. Nevertheless,



the mere accumulation of data is not enough to produce knowledge nor to enable robust predictive approaches. Data sciences already offer toolboxes covering most data mining building blocks. However, the current state-of-the-art in machine learning and data mining cannot address the variety of challenges emerging from cutting-edge research, and off-the-shelf algorithms rarely exhaust the richness of information in data and experiments. The new paradigm of data-driven science requires the cross-fertilization of data analysis, which now comes with a large and powerful toolbox of general-purpose algorithms and optimized building blocks, with a scientific reasoning adapted to each application, focusing on the right questions and drawing out the relevant information. While every case is specific, the methodology is shared between biology, geography and sociology (to name just a few examples), and scientists can take advantage of the new possibilities and develop their methods together.

The present pandemic epitomizes the structural transformations of our common world with interactions growing in density between nature and human societies, on a global scale, and in the dissemination of digital technologies. The resulting global challenge faced by all institutions and societies has demonstrated the urgent need for scientists to define, produce and manipulate relevant information describing interactions between large systems, that is, the need for efficient and agile scientific modeling, a condition for smooth interactions between practitioners of different fields.

Scientific strengths and international partners

With strengths and international recognition in fundamental sciences, ENS de Lyon has already engaged in several interdisciplinary initiatives along the lines proposed here. The Centre Blaise Pascal (CBP) is a major hub for modelization tools dedicated to chemistry and physics. IXXI was not only instrumental in developing methodology aspects of artificial intelligence and applications, but also initiating links on the modelization of social sciences. It is a precursor of what we want to amplify. Geophysics data has instigated host presentations on algorithms relevant for planetary and earth sciences. Biologists are developing new initiatives with mathematicians, computer scientists and physicists to study and model gene expression in time and space.

In several bachelors and master's degrees, new courses on simulation or modelization have already started. A course on "Mathematical modelling" started this year, a transdisciplinary module on "Understanding digital worlds" is offered to first-year students since 2019, as well as a new course on "data modelization in life science". Recent faculty recruitments strengthened research in modelization. Seeds of growing knowledge have been planted and should develop into the new stages in the near future. At ENS, all science labs will be extremely involved: Mathematics (UMPA), Computer sciences (LIP), (astro/geo)-Physics (CRAL, LGL, LPENSL), Biology (CIRI, IGFL, LBMC, RDP), Chemistry (CRMN, LCH), but out of the Humanities research labs, especially GATE (economics) and LARHRA (history). Most teaching departments, however, are concerned with a barycenter on sciences.

Main themes of research and impact on training

Scientists of many disciplines face several common imperatives that this project intends to address with the aim of developing a shared culture of modelization (dynamical systems, stochastic models, hybrid models, ...). Firstly, the scientific disciplines should increase their interactions along the following lines:

- The development of new tools and instruments allowing for the accurate multiscale measurement of the behavior of the systems under study.
- The development of novel experimental models. They can be innovative digital or natural models such as digital organisms (or non-conventional model organisms in biology) complementary to existing ones.
- The integration of data of diverse origins. For example, life sciences and in particular animal and plant development benefit from integrating disciplinary systems behavior analysis with other relevant data such as physical, chemical, and environmental parameters within living systems.
- Transferring successful tools and instruments from a field to other areas implies adaptations through multidisciplinary collaboration. Some recent usage of machine learning or Markovian models in social sciences attests to the potential of cross fertilization.
- Recent evolutions across fields question the very process of modelization, calling for reflexive analysis.



In parallel, the appropriate quantification of phenomena studied, in sociology or political science in particular, but also in economics, is a major issue. Attention will therefore be turned to individual data, collected in ways that can be used scientifically, including controlled experiments similar to those practiced in the experimental sciences. The formalization of data and the construction of models make it possible to test empirically the relevance and validity of the rules governing a community or a society and to derive predictions about their behavior that can be useful for public decision-making.

Modelization should be fostered since multidisciplinary approaches have great potential, given the very broad spectrum of disciplines within the institution, a unique feature on the Lyon site. This strategic priority is the one in which the bottom-up process will be the most present. The first step is to increase the number of cross-disciplinary modelization projects between exact and natural sciences at ENS de Lyon. Building on this expertise, natural developments will lead to controlled experiments in social sciences that will be appropriately quantified.

2.3.4 Public Affairs - Towards a Lyon School of Public Affairs (LYSPA)

Ambition and models

The LYSPA project intends to mix research and high-level training for future managers, policymakers, and decision makers in public affairs, as well as experts of public policy evaluation, for careers in senior civil service or in public-oriented private companies. LYSPA aims at responding to the challenges of regulating and administrating contemporary societies in a globalized world, with increasingly complex, composite types of stakes and forms of governance on numerous levels, while preserving the spirit and ethic of the public interest and service. For this to happen, it will mobilize fundamental research, applied research, initial training and ongoing training, by combining the strengths of Sciences Po Lyon and ENS de Lyon, which already share common training programs and research centers.

LYSPA is modelled on international schools of Public affairs, such as the John F. Kennedy School of Government at Harvard (<https://www.hks.harvard.edu>), the Woodrow Wilson School at Princeton (<https://spia.princeton.edu>) and a few other founding models in the U.S. In France, public affairs tend to be understood through disciplinary approaches (political science, economics, law etc.). LYSPA, on the contrary, opens up to the domain of social sciences, with a cross pollination of knowledge and skills between disciplines, addressing the complexity and cross-cutting relevance of urban policy and city governance, environmental policy and management, health, information and technology, without neglecting more technical issues such as management of non-profit organizations, public finances and budget, public management, and analysis of public policy.

Context

The project is anchored in a rich political ecosystem where a forward-thinking, active region, and a diversity of territorial configurations constitute a fertile and innovative ground for understanding public affairs and developing new ways of governing territories. ENS de Lyon and Sciences Po Lyon attract students from all around France and from abroad. LYSPA could support a transformative effect by strengthening the emergence of such an outstanding and innovative school outside Paris and the capital region, dedicated to a more decentralized and inclusive conception of public affairs.

Current reforms in the French administration offer opportunities to renew education in public affairs. These reforms are precisely driven by the renewal of the administration elites based on diversity. Since 2008-10, both Sciences Po Lyon and the ENS de Lyon have been implementing programs that diversify their recruitment process, notably in the framework of the national program “Cordées de la réussite”. The program targets low-income families and secondary schools located in deprived territories. The School of Public Affairs will be a lever to attract new talents.



Call for proposals – 2021
Appel à projets vague 1

**EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (EXCELLENCES)**

TOOLS

Document de soumission / Submission form

Scientific strengths and international partners

The program is notably grounded in research laboratories that contribute to the knowledge on public action and policy: TRIANGLE (political science, urban planning, sociology elements, notably academic education and knowledge, and institutional and political economics), Max Weber Center (sociology), GATE (economics), EVS (on interplay between environmental, urban and social issues), LARHRA (modern and contemporary history), and IAO (with an international focus on Asia, urban policies, territorial governance and innovation policies in particular). Both founding partners of LYSPA also rely on excellence in their research initiatives built in the framework of previous PIA: the Labex IMU on urban intelligence and the Lyon Urban School (EUL Institut Convergence), the Labex COMOD on ideas, institutions and practices of European democracies, and the H2O'Lyon EUR providing future leaders and players in the water sector with the tools to improve their practices. At the cross section between academic research and action-research, two Chairs have been set up since 2019 in Sciences Po Lyon: one on “Transformation of Public action”, the other on “Social protection and territories”, with a set of public and public-oriented private partners.

Foreign partners in the field of LYSPA include the Hongkong Baptist University and the University of Loughborough (UK), with whom double diplomas have been established with Sciences Po Lyon, but also the Batten School of Leadership and Public Policy (University of Virginia, US) and the Maison française d'Oxford (MFO, UK). Other foreign partnerships with the London School of Economics and political science (UK), the Collegio Superiore in Bologna and Rome Tre (Italy) or with Freie Universität in Berlin (Germany) provide a comparative overview of public affairs in European or non-European context.

Main themes of research and impact on training

The Lyon Public School of Public Affairs will be structured around 3 main thematical challenges, each being backed by research activities and specific training courses:

- Enhancing diversity and equity for a more inclusive society in public affairs, referring to all the current reflection on public policies in France and abroad such as gender equity or social equity, or diversity of backgrounds and origins.
- Promoting governance and democracy, with special reference to major fields such as health policy, urban transformation and territorial governance. The intricacy of a diversity of stakeholders (private, public, civil society) within various levels of action will be particularly emphasized here, in line with new forms of citizens' empowerment.
- Renewing administration and public action: the new challenges of public action now concern cross-cutting issues (healthcare, vulnerabilities or environmental policies) and need to be addressed through interdisciplinarity and living labs such as the “Public Factory” developed in 2018.

Based on the idea that efficient and adaptable public policies are grounded in technical skills and reflexive practices, the curricula aim at moving from theory to practice. It will provide a selection of students with selective training at undergraduate and graduate degrees, following 4 main directions:

- Innovative action-research based on expressed needs of public actors and public-oriented private stakeholders, on the model of the aforementioned Public Factory;
- Intensive periods of training such as summer schools, dedicated to emerging transversal issues in public affairs (such as healthcare policies, environmental issues, etc.), with experts from national and international administrations and services (such as the World Health Organization, in neighboring Geneva);
- Preparation to the civil servant competitive examinations (development of the prép'A+ jointly opened since 2018 for A+ public administration).

The reputation of the ENS de Lyon in PhD training along with the experience of Sciences Po Lyon in public affairs (the latter also operating the PhD program of political science for the doctoral school) could be a lever to attract young post-doctoral degree holders to the Lyon School of Public affairs with a career plan for public administration.



ENS de Lyon and Sciences Po Lyon combine their specificities in the training of high-level civil servants and research, to develop an innovative school of public affairs in the French context. It will address the new challenge of French administration reform and the rising concern of territorial governance in a globalized and uncertain world, through innovative training methods. It will lead to the rise of a strong pole of public affairs outside the Paris region with a focus on a more decentralized and inclusive conception of public affairs.

2.3.5 Cultural and Scientific Mediation

Ambition and models

Based on the conviction that collaborative and shared knowledge can be beneficial not just for the public, but equally for the academic community, the ambition is to provide a new platform for innovation, accessibility and cross-disciplinarity in cultural mediation, allowing academics, students, artists, and professionals to develop new skills and experience new modes of interaction. Knowledge can be acquired both inside and outside universities, formally and informally, through exchange, reaction, and creative response.

This initiative is in line with developments at the international level, such as the MIT science impact collaborative (<https://scienceimpact.mit.edu>), the Harvard innovation labs (<https://innovationlabs.harvard.edu>), the strong academic structuring for creation-research at the Université du Québec à Montréal (<https://uqam.ca>), and other coordinated developments of innovation throughout the world.

Context

Addressing this goal involves widening of the scale of academic activities towards new audiences, education of the general public and a better accessibility to the possibilities of doing and thinking, the conviction that the highest-ranking institutions of education and research in Arts and Science at the European level must now be able to transfer and translate their abilities for the benefit of a more general public. The widening of the scale of our activities now depends on the answers and attractive methods we provide for a more selective, proactive and creative approach of knowledge production and acquisition.

The change we wish to bring involves a complete reassessment of sharing in the process of knowledge production. The results and efficacy of knowledge depend on the process and on the understandability of the process of knowing and doing. The function of culture and mediation should therefore never be separated from research and learning. Now and more than ever, culture embodies the need for a renewed openness to the world, a renewed appetite for cultural discovery, the need to share practices, experiments and experiences that connect the world of research, learning and training to society at large. Sharing and finding both the forms and the methods to enhance sharing will be beneficial not just for the public, but equally for the academic community, allowing academics, students, artists and professionals to develop new skills.

Scientific strengths and partners

The collaboration of ENS-Sciences Po-CNSMD addresses and magnifies the various aspects of the challenges of these three major institutions, because they are engaged in both strong theoretical and practical dimensions in their fields, and because they carry the awareness of the necessity of public outreach, each one tackling the core problem of how and what they need to communicate from various angles.

As a leading French institution in research, education, and learning, ENS de Lyon has been developing outreach activities involving cooperation with schools, and other higher education and cultural institutions in the City of Lyon, the Grand Lyon area or the region. ENS de Lyon, together with Sciences Po and the CNSMD, is aiming to provide a new platform for innovation, accessibility and cross-disciplinarity in cultural mediation. Drawing on its experience in bringing practitioners,



professionals, academics, and students together to work collectively at producing and exchanging knowledge, it is determined to scale up its outreach activities to promote positive change through transformative learning. Through a wider range of actions, one intends to contribute to society while pursuing education and research at the highest international levels of excellence.

Very significant structures and actions that connect research and education to culture and mediation have been developed:

- Maison des Mathématiques et de l'Informatique (MMI) is our own mediation hub where students and academics dedicate their creative energy to the dissemination of mathematical and computer knowledge to the wider public through a wide array of media and in a great variety of formats (live and virtual events, festivals, exhibitions, games...).
- Long-standing partnerships with the École nationale supérieure de la photographie in Arles, the Institut d'Art Contemporain in Villeurbanne, the Musée des Confluences in Lyon allow students either to work jointly with their counterparts from the École nationale supérieure de la photographie in order to put together a photography exhibition, or with museum professionals as a junior scientific committee or, as junior curators, and get involved in the making of exhibitions – some of them are displayed in the own art gallery which is open to the public. -Joint collaboration between CNSMD and ENS with the International Festival of Music in La chaise Dieu, one of the major French festivals.
- At Sciences Po Lyon, students and teachers work with the Arty Farty Association, to include more creative and cultural initiatives in public policy at national and European levels, notably for the reduction of the generational, territorial and social divides. The partnership takes place in the master's specialty on management and cultural action at an international level (MACI), through various events such as Nuits Sonores and the European Lab. Sciences Po Lyon will also organize scientific events open to the public: culture and creation; new media; contributions of the creative and cultural sectors to the democratic debate at local, national and European levels. We aim to build new common projects, for students on initial as well as ongoing training, through the Public Factory Living Lab (within which, for example, a project was developed for and with the help of the city's Art Museum - Musée des Beaux-Arts de Lyon), internships and projects (4th and 5th years).
- Events and master classes foster exchanges between students and artists, authors, or professionals such as curators or playwrights (at the Institut d'Art Contemporain in Villeurbanne, the École nationale supérieure d'architecture de Saint-Étienne, the Musée des Beaux-Arts de Lyon, the Villa Gillet, the Théâtre des Célestins, etc.).
- A sustained policy of partnerships with public or private institutions for artists' residences devoted to the students of CNSMD and a major venue for 450 concerts and events each year has been set up.- Every year we have an exciting cultural line-up in the ENS de Lyon Théâtre Kantor with plays, film screenings and themed festivals, as well as conferences and debates, which, before the Covid pandemic, were open to the public.
- The activities of PERSEE in selecting, collecting and giving access to scientific papers on the Web, and the wide range of editorial work and publishing at ENS Éditions are also strong assets.
- Cultural mediation is a concern and practice shared by all the research units.

Main themes of research and impact on training

Bearing in mind our newly gained experience during the recent Covid pandemic, we want to devise formats that will enable us to reach new audiences wherever they may be.

Fully embracing the issues tackled in the areas of transdisciplinary research that we intend to develop in the next decade, we are planning to apply innovative and evidence-based approaches to empower the public for innovation and cultural renewal.

Mentored by academic staff, first-year ENS de Lyon students will offer a range of online and face-to-face events aimed at secondary-school pupils (mainly from last 2 years of secondary school) in order to provide data, scientific update and methodology in the topics featuring in the Baccalauréat curriculum (in the forms of podcasts, posters, mini keynotes) so as to help pupils gather valid scientific information and structure it.



In subsequent years, as follow-ups to those actions, we want to promote community engagement junior projects aiming at making the world a better place by proactively reaching out to young citizens to help them reach their educational goals. Moreover, drawing on the establishment of links with cultural institutions, the associative sector, and/or local authorities, we intend to provide scientific information forums for the public in the form of events, scientific and artistic festivals as well as through online observatories providing free access to analytical information regarding fundamental scientific, social or cultural issues.

Drawing on our existing partnerships and on new collaborations, for instance, with the École nationale des Beaux-Arts de Lyon, we want to develop curricula and pedagogy grounded in cultural production. Staff and students will create joint courses with museums of arts and sciences, building on and exploiting the research value of collections and staff expertise to establish bridges across territories and disciplines. The 5th year specialty MACI in Sciences Po Lyon (Management and cultural action at the international level) contributes to this goal, in the context of cultural institutions and cooperation that are international, national, decentralized, public or private. Students then acquire skills in cultural management, copyrights, project development and management, cultural marketing and sponsoring, and get accustomed to various international and European cultural areas.

All three partner institutions want to further their cooperation with museums, theatres, and art schools to design new educational formats to engage primary and secondary school pupils. Ultimately, we want the students to be involved in research-creation processes where mediation is not simply an instrument or a tool, but the very element of culture, of creation itself and of creation as research. Rather than simply attempting to “represent” or report knowledge, cultural mediation within research creation is a tool to inspire, and drive innovation: new concepts, new ethical, political concerns, new problems and approaches in times of accelerating changes. In line with this ambition, the CNSMD aims at not only fostering creation but at shifting its research focus on creation itself, without restricting its actions to music or musicology.

In the fields of arts and science, ENS-Sciences Po-CNSMD face the highly critical challenge of orienting major developments and shaping the new landscape of academic activity and outreach, of favoring knowledge and integration of knowledge in society. Reconnecting domains and dimensions that have long been wrongly and detrimentally disconnected is the overarching goal of a new timely approach of the arts, science and society.

2.3.6 Adaptation of strategic priorities in training

At ENS de Lyon, disciplinary training through research does not exclude multidisciplinary approaches, provided that we understand the latter as an indispensable dimension in dealing with the major questions posed to science today. The ENS de Lyon diploma is a 4-year course structured around training through research rooted in the fundamental disciplines of knowledge and part of a demanding curriculum of which the doctorate, in France or abroad, is an integral part. Within the TOOLS project, in line with each of the 5 strategic priorities, training will be as follows: (i) an open module during the first year, accessible without preconditions and offering introductory courses and case study workshops; (ii) targeted courses during the following two years, in addition to the validation of a disciplinary master's degree oriented towards research. During the third year of training, student volunteers have the opportunity to get involved in the creation of junior laboratories; these structures, with their own research budget, have long been in existence at ENS de Lyon; (iii) the fourth year brings together students from different disciplines to finalize their training in line with the 5 strategic priorities: additional courses, workshops, masterclasses, internships within a *Research Center* or abroad, PREPA+, ... — in any case leading to the use and/or production of innovative research. This training may take the form of a multidisciplinary master's degree, widely opened to the international community and to actors from social and economic circles. It is a common vocational training approach in the economic sectors (for example an MBA) that the project aims to focus on the most acute issues of our societies.



Call for proposals – 2021
Appel à projets vague 1

**EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (EXCELLENCES)**

TOOLS

Document de soumission / Submission form

At Sciences Po Lyon : The implementation of the Lyon School of Public Affairs will enhance our capacity to train high-level managers in public administration as well as public-oriented private companies, through innovative project-based training (within a “Living lab” where private and public actors meet students and get advised and oriented by them through policy design processes), and through intensive in-place training with experts, which both complete the more traditional pedagogy of semester-based courses.

At CNSMD, the impact on training will be significant with the addition of social sciences and humanities in the curriculum. The shifting of research on arts and creation as a proper object to one focused on creation itself, is inspired, for instance, by the Centre for Musical Performance as Creative Practice, <http://www.cmpcp.ac.uk/> at Kings College London (UK) or Orpheus institute in Ghent (BE). One expected result could be the development of PhD courses in “research and practice”.

2.4 INTERNATIONALIZATION

Internationalization is at the heart of our action, for our academic staff as well as for our students. For instance, at least three months of academic experience abroad are required in the ENS degree, and students do often more, between 6 months and a full year. Student mobility (exchanges, internships, TAs, ...) in foreign universities is supported by over 200 bilateral agreements. We strive to offer visiting students the best possible living experience. ENS de Lyon has been awarded the "Bienvenue en France" label 2019-2023 at the highest level (3 stars) by Campus France. This label recognizes the quality of the onboarding and hospitality facilities, the course offering and pedagogical support, accommodation (priority housing in student residences is granted) and quality of life on campus, as well as the quality of post-graduation follow-up. ENS de Lyon is committed to the European Human Resources Strategy for Researchers (HRS4R) chart, obtained in 2019.

Within the framework of the TOOLS project, international initiatives must promote a global awareness, as already proposed by leading institutions (<https://international.princeton.edu/research-abroad/funding-international-research>), in a move aimed at joining the dynamics of major league institutions. In a changing and uncertain global context where historical political equilibria are challenged, where humanity is facing unprecedented global issues in terms of health, resources, energy, pollution..., where the legitimacy of science and scientific discourse are increasingly discredited in the eyes of public opinion, higher education institutions must play a central role in bringing contributions and reconsidering how to spread Knowledge, Education and Science more widely. Joining skills and know-how of international partners will be crucial to succeed.

In order to implement our internalization strategy and global commitments, we will mobilize increased resources in the coming years to implement the following actions:

Action 1. Attracting the best international students within the framework of a "PhD track" program (including one to two years of Master's degree and three years of PhD degree. Students would be joining at graduate level within the framework of exchange programs, double degrees, research contacts, etc. through extensive communications in targeted social media. Bilateral agreements with our close partners already promote this initiative. Depending on disciplines and in order to ensure an optimal level of recruitment, the "PhD track" program will be accessible at Bachelor's level or Master's level. The opportunity for students already holding a Master degree to join the program is an inclusive approach to give a chance for candidates to show their potential and get PhD financial support. Students will be awarded a scholarship (12'000€/year) during their Master's.

Selected students would be offered early a PhD grant, provided they meet a set of criteria (the process will include evaluations by research teams interviews and appropriate follow-up during the Master). Decisions will be made as needed, bearing in mind that academic calendars are quite different



Call for proposals – 2021
Appel à projets vague 1

EXCELLENCE SOUS TOUTES SES FORMES – EXCELLENCE IN ALL ITS FORMS (**EXCELLENCES**)

TOOLS

Document de soumission / *Submission form*

worldwide. During the PhD thesis, the student will be involved in activities including: (i) teaching or mentoring Bachelor and Master students; (ii) participation to scientific outreach activities; (iii) contribution to dedicated international courses organized jointly by partner institutions (such as the CECAM events in Europe — <https://www.cecarn.org/>).

Action 2. Visiting professor chairs will be targeted at reinforcing cooperation, internationalization of our programs, promotion and dissemination of science. They would meet one or more of the following characteristics: leading academics with high international visibility, ability to communicate with specialists (masterclasses) and general public alike. Visiting professors would either come for a three-months stay in Lyon or for a one-month period for three consecutive years. They will benefit from a dedicated support for administrative, housing and other errands.

Visiting professor chairs would contribute to outreach initiatives, such as conferences on "Global Challenges", or "hands on" experiments as promoted by Maison des Mathématiques et de l'Informatique (<https://milyon.universite-lyon.fr/labex-milyon-mathematiques-et-informatique-fondamentale-55447.kjsp>) or the Indrani Balan Science Activity Centre at IISER (<https://www.iiserpune.ac.in/outreach/science-activity-centre>). They would also be required to teach a graduate course in their area of expertise. The development of joint PhD will be strongly encouraged, and financed in our bilateral agreements, in the spirit of the Joriss platform with ECNU/Shanghai.

Action 3. Outgoing student, teaching, research and administrative staff mobility. Despite the dramatic development of remote interactions over the past year, stays abroad remain a central part of the process to develop interculturality and awareness of being a world citizen. It is also an instrument of wide diffusion and influence of our fields of excellence at the international level. We will improve financial support for our students (320 grants per year) and set up a program for our academic staff (based on a call for projects, 8 grants per year for 3 months stays abroad). We will also take care of the environmental impact of these mobilities by encouraging sustainable transportation, via a "sustainable bonus" in mobility packages. Involvement of our staff and students in societal, environmental or ethical commitments in a global dimension at the international level will be encouraged and recognized (NGOs, development actions, participation and contributions in international conventions on the climate or other global issues, etc.).

2.5 TRANSFORMATIONS INVOLVED

2.5.1 Contribution to helping society's transformations

The entire TOOLS initiative is to be developed in conjunction with recent state policies and reforms. It is to be placed in the wake of the measures proposed to open up recruitment to a diversity that reflects that of society — Amélie de Montchalin: "The senior civil service has lost in terms of social diversity", *Le Monde*, 07 October 2020. This is also the case with the opening up of higher education to a link between research and training on societal issues. In the context of reforms in the French administration oriented to the renewal of the administration elites based on social and gender diversity, the TOOLS project aims at training senior civil servants able to cope with social, political, sanitary, environmental and economic risks. LYSPA will therefore contribute to address the challenges of tomorrow in an unstable and uncertain world.

2.5.2 Transformative dimension of the project's lines of action

For our students, the impact lies in a widening of the curricula better adapted to the expectations of our societies. This will benefit the quality of public services as many of our graduates will be public servants,



in academia, civil service and cultural institutions. As such the transforming impact is quite significant, in terms of diversity access to the highest levels of the French administration at large. These executives, educated in dealing with complex and global issues, in addition to their traditional expertise, will pave the way for future steps of decompartmentalization of both knowledge and actions. In fact, the development of multidisciplinary training for the study of global issues, particularly in the mixing of arts, sciences and humanities has the potential of becoming a standard for executives with the ambition to access the higher level of governance.

The impact is not limited to the public sector; people with this set of abilities will be increasingly needed as global issues are addressed. This demand, may in turn generate a positive cycle, with upcoming generations gradually more concerned by global issues, so that more people with diverse background will be attracted towards higher education (including PhD training) and resulting careers. Diversity and global topics are indeed a side step from the traditional focus of institutions too often associated with single-minded, self-centered temples of knowledge. The TOOLS initiative and its opening to the modern challenges of our societies will contribute to a 21st century evolution of the very culture of our institutions in research and teaching. This evolution builds on our very foundations, both in our capacity to develop and transmit knowledge at its highest level, and in our pioneering role as spearheads of state policies.

The move is also expected to generate a positive momentum fostering an increase of motivation / sense of purpose of our personnel, therefore an enhanced work environment. This is by no means a by-product, as the initiative relies on the support of all admin and technical staff.

Internationally, attractivity will be significantly fostered. First as a result of our inclusion of practice well developed by other foreign institutions, and also as several projects in the initiative can become worldwide leaders. In this endeavor the TOOLS initiative falls in line with the ambitions of Lyon and the Auvergne-Rhône-Alpes region, as a leading intellectual, cultural and economic hub.

3 MANAGEMENT AND PARTNERSHIPS

3.1 PRINCIPLES

The TOOLS initiative relies on institutions that are used to working together and know each other well, and have already proven their ability to innovate, especially since 2013 within the framework of the CHEL[s] — with the creation of common courses, shared modules, MOOCs, student projects, with shared research laboratories in the humanities and social sciences. The working habits of the Schools, in particular their size, the proximity of the teams and their reactivity, will allow a strict monitoring of decision-making processes, with an annual and multi-annual analysis of the impacts. The international benchmarking is essential, particularly when working on strategic priorities than have been foregrounded by leading international institutions.

3.2 ORGANIZATION OF DECISION MAKING

The project is led by a Governance Council that brings together the 3 heads of the institutions and their deputy training and research. This Council shall adopt the strategic guidelines, the monitoring processes, the criteria for evaluating the actions and the annual budget allocation. The Governance Board meets at least 3 times a year. Within the budgetary framework of each of the institutions and of the constitutive agreements between the institutions, the annual measures are submitted to their Boards and their scientific councils.

An operational Steering Committee is composed of the project leaders and administrative managers of the three main lines of action: diversity, strategic priorities and internationalization. This committee is responsible for monitoring milestones and indicators, producing deliverables, studying and



processing problems encountered and suggesting course corrections. Each action is the subject of an annual report, presented to the steering committee and the academic bodies of the 3 institutions. The strategic priorities have their own academic leadership, made up of 3 academics: Modelling (3 ENS); Environment & Resources (2 ENS, 1 ScPo); Understanding crises (2 ENS, 1 ScPo) ; Public Affairs (1 ENS, 2 ScPo) ; Culture et médiation (1 ENS, 1 CNSMD, 1 ScPo).

The research and training actions that accompany the 5 strategic priorities are appraised annually by a scientific committee which brings together (i) representatives of the scientific councils (or equivalent) of each of the institutions and belonging or not to it, (ii) representatives of the research organizations, (iii) experts of international rank, outside the academic site — in a proportion at least equal to 1/3. The Scientific Committee may not comprise more than half of the members belonging to the site.

The budget of the project is managed by ENS de Lyon in a dedicated Budgetary Responsibility Center (known as CRB in French). The analytical lines of this CRB bring together the funds allocated by the institutions and the contributions of the PIA4 "Excellences" program and any other Call relevant to the initiative.

Due to the social scope of the initiative, an annual report or an annual presentation of the results obtained in terms of new openings and impact in research and training will be presented to the partners and authorities.

3.3 QUALITY AND MONITORING

The ambitions and expected results in the 3 objectives of the TOOLS initiative, and the projects that will be developed under these, will be broken down into smaller objectives and factual elements, if possible quantified, and will be formalized in a roadmap indicating precisely, during the project, the key steps and indicators to be used. An analysis will be carried out regularly by the Scientific Committee and the Steering Committee to assess the conformity of the results with the expectations that have been formulated. This analysis may lead to decisions by the governance board and a readjustment of the direction to be taken or the distribution of resources to return as closely as possible to the milestones of the roadmap.

Maximizing access to the high-level training of our institutions: during the first years, it will be a question of consolidating the criteria that make it possible to evaluate the progress towards diversity of the selected students, and the relevance of the associated actions: upstream of the applications (catchment areas, dissemination of information, ...), in the selection process and in supporting students. An important part of the success is related to the attractiveness, especially that of students outside the traditional catchment areas, and internationally. These ambitions require significant communication in the post-baccalaureate sector of higher education, and upstream in high schools, as well as in higher education institutions in France and abroad. With the first cohorts will come the stage of monitoring job opportunities, and the quality of professional integration, as perceived by the student and by the employer. It will be fundamental to quantify how the opening-up of our schools has helped to advance diversity among the major decision-makers and contributors to society.

Development of Research Centers: for the strategic objectives, the resources allocated, including recruitment, scientific production will be evaluated annually quantitatively and qualitatively by the Scientific Committee. Particular attention will focus on (i) performance in comparison with international reference centers, (ii) impact in the training offered by the institutions, attractiveness to students and (iii) the expectations of academic or socio-economic partners.

Internationalization. Essential indicators will be found in the attractivity of the PhD-track program, the track record of invited professors, the success and variety of student and staff mobility.



Call for proposals – 2021
Appel à projets vague 1

EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (EXCELLENCES)

TOOLS

Document de soumission / Submission form

3.4 FUNDS COMMITED

ENS de Lyon has 22 research labs, 11 departments, 2'400 students including 450 at PhD level, 590 administrative and technical staff, 240 academics and hosts 400 personnel from national research organizations (CNRS, INRIA, INRAe, INSERM), and local universities. Its budget is equal to 140M€, with about 100 M€ allocated by the State.

Sciences Po Lyon has 3 research units (2 shared with ENS), 1'800 students, 73 academics and 60 administrative and technical staff. Its budget is over 5.2 M€ with over 2 M€ allocated by the State.

The CNSMD has 10 teaching and creation departments, 650 students, 70 administrative and technical staff and nearly 200 faculty members (and as many visiting instructors). Its budget amount to 13.2M€ with 11.6 M€ allocated by the State.

These institutions will contribute with over 20% of human resources engaged in the various strategic priorities. Together with other expenses, the total amount dedicated to the TOOLS initiative will reach 5% of their net budget, that is over 7 M€. This amount is equivalent to the funding requested from PIA4 in the present proposal.

3.5 OPENDATA AND IP

ENS de Lyon has started considering signing the DORA convention, the deposit in open archives of the full text of publications from the institution, encouraging academics to publish in open access journals, and even support for the creation of one or two journals based on a similar model, and the withdrawal from other journals that require publication fees. This will involve supporting the deposit in open archives, the monitoring and alignment of identifiers and repositories in digital humanities as well as the safeguarding of data and their opening.

The Living Lab called Public Factory, placed as one pillar of the Lyon School of Public Affairs (LYSPA) project that directly involves Sciences Po and ENS de Lyon, will include the requirement of disseminating part of the results of the students' collective work under opensource rules.

ENS de Lyon has a responsive and on-site, "Service de Valorisation" - Technology Transfer Office (TTO) in charge of helping academics in their collaborative projects with private partners, protection and transfer of their research results whatever their field is, in humanities or sciences. The TTO provides broad support to the ENS Community with innovation marketing, legal aspects (IP, patents, contracts, etc.), creation and development of start-up (with its own business incubator), and administrative tasks. The TTO also manages the intellectual property (PI) resulting from research and takes care of technology transfers (search for partners for exploitation and operating contracts, financial returns, redistributions, etc.). As part of this undertaking, the TTO relies on SATT PULSALYS (Technology Transfer Acceleration Company in Lyon, with shareholders in local and national French public research organizations).



Call for proposals – 2021
Appel à projets vague 1

**EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (EXCELLENCES)**

TOOLS

Document de soumission / Submission form

4 JUSTIFICATION OF MEANS

The funding proposed in the TOOLS application is split into the 3 major lines of action:

- **2.5 M€/year dedicated to scholarships**, distributed among three levels: 7'200 €/year of additional grant for students who receive a state allowance at levels 4 to 7 (about 15% of scholarships); 5'400 €/year for students who receive a state allowance at levels 0bis to 3 (about 21% of scholarships); 3'600 €/year for the others (about 64% of students). In numbers, this represents 125 supported students at ENS de Lyon every year for 4 years; 50 students at Sciences Po Lyon for 2 years of the competitive graduate cycle, and 16 students at CNSMD for 5 years.

- **2 M€/year for international actions**, among which 480 k€/year for 320 grants for a 3-month outgoing mobility; 166 k€/year for invitations of foreign professors for a three-month duration during which they will teach a 20h-class on the subjects related to that of the inviting the *Research Center*; 100 k€/year for stipends dedicated to international mobility of academic and administration personnel; 850 k€/year for 6 PhD-tracks /year (Masters and PhD); 440 k€/year for 10 postdocs/year and 60 k€/year for visits of co-supervised PhD students.

- **1.5 M€/year for research centers**. Each of the 5 strategic priorities will receive 200 k€/year for research, and a global 500 k€/year will help finance investment in high-level scientific equipment.

Sustainability of funding: the end of PIA3-IDEXLYON funding has brought about the interruption of almost all collective actions because institutions were neither prepared nor willing to contribute from their own budgets. The partner institutions ENS de Lyon, Sciences Po Lyon and CNSMD are committed to prevent this to happen to actions started in the context of the TOOLS initiative. As such they committed, from start, to ensure the persistence of the proposed lines of action. Over the next 10 years they pledge to increase their income to cover at least 30% the PIA4 endowment. Levers that can be pulled include (but are not limited to): private and corporate sponsorship, increased success to national (ANR, PIA) and international (ERC) calls, ...



Call for proposals – 2021
Appel à projets vague 1

**EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (EXCELLENCES)**

TOOLS

Document de soumission / Submission form

Annexe : Présentation de l'établissement coordinateur

Ecole Normale Supérieure de Lyon (ENS de Lyon) is a world-class academic institute of excellence in higher education and research, and was ranked 5th of the World's best small universities (THE, 2018). Training through research: students of ENS de Lyon are recruited by highly competitive examination (with less than 4% of acceptance rate) and are offered courses of the highest level. 12% of our students are international students. Cutting-edge Research: more than 700 academics from literature to quantum physics, in 30 research structures and high-tech equipment, and 13 scientific and technical platforms. Expertise and research foci of the institution are based on strong disciplinary competence (around 1100 publications/year in Humanities, Letters, Social Sciences, Mathematics, Physics, Biology and Chemistry), interdisciplinary and international cooperation (262 exchange partnerships with 26 countries) as well as partnerships with national research organizations (CNRS, INRAe, INSERM, INRIA, Universities). ENS de Lyon supplies its laboratories with state-of-the-art equipment and facilities and provides support services to academics and researchers in their initiative (Innovation and Technology Transfer Office, Office of International Affairs, Human Resources, ...). ENS de Lyon provides administrative and language resources for visiting students, postdocs and faculty members. ENS de Lyon has obtained in 2019 the HRS4R "Human Resources Strategy For Researchers" label. ENS de Lyon has also developed junior laboratories for Master's and/or PhD students to create their own research laboratory for a two-year period, and has incubated more than 20 start-up companies since 1994 (more than 140 jobs created). ENS de Lyon manages national, European and international funding (participation in 55 H2020 projects) and administers a Research Fund, to finance high-level scientific projects (Budget: 1.5 million euros).