

Colloque international du projet
I dex Impulsion PartiScip

international workshop of the I dex
Impulsion project PartScip

**Sciences participatives :
nouveaux défis épistémologiques,
éthiques et politiques**

**Citizen science: new epistemological,
ethical and political challenges**

Organisé par/organized by :
Stéphanie Ruphy et Baptiste Bedessem
(Université Jean Moulin Lyon 3)

Conférenciers invités/invited speakers :
Justin Biddle *(Georgia Institute of Technology)*
Florian Charvolin *(Centre Max Weber, Saint-Etienne)*
Denis Couvet *(Muséum national d'histoire naturelle, Paris)*
Romain Julliard *(Muséum National d'Histoire Naturelle, Paris)*
Kristina Rolin *(Helsinki University)*

6 juin 2019

Université Jean Moulin Lyon 3
18 rue Chevreul - Lyon 7^e
salle de la Rotonde (6^e étage)

7 juin 2019

Maison des Sciences de l'Homme
14 avenue Berthelot, Lyon 7^e
salle Elise Rivet

Programme détaillé/detailed program:
<https://www.partiscip.com/>





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- Université Jean-Moulin, Lyon 3
- Institut de Recherches Philosophiques de Lyon

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GENERAL INFORMATION

About the Workshop

The two days workshop will start on Thursday, 6 June, at 9h30 a.m and will end on Friday, 7 June late afternoon (around 6 pm).

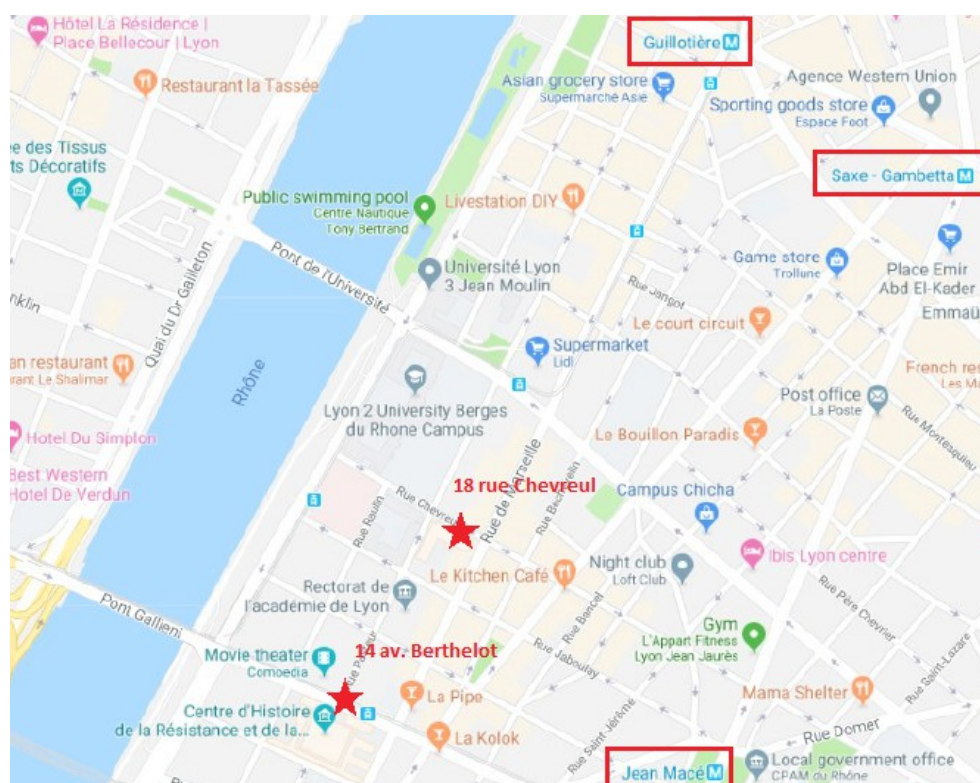
Location: Université Jean-Moulin Lyon 3, Campus des Quais. The campus is situated in the center of the city of Lyon, France. Website: http://www.univ-lyon3.fr/welcome-to-jean-moulin-lyon-3-university-931913.kjsp?RH=INS-ACCUEIL&RF=INS-ACCUEIL_EN

On **Thursday, June 6th** the presentations will take place at the Salle de la Rotonde, **18 Rue Chevreul, sixth floor**

On **Friday, June 7th** the presentations will take place at the Maison des Sciences de l'Homme, **14 avenue Berthelot, Salle Elise Rivet.**

The lunch and coffee breaks will take place at the Salle de la Rotonde, **18 Rue Chevreul, sixth floor** or at the Cafétéria de la Maison des Sciences de l'Homme, **14 avenue Berthelot.**

Both the rue Chevreul and the avenue Bertelot are located in the 7th district of Lyon, near the subway stations “Guillotière” (line D) and “Saxe-Gambetta” (line D and B) for rue Chevreul, and Jean-Macé (line B) for avenue Berthelot.



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About Lyon

The 2,000 years old city of Lyon is famous for its historical heritage and for its art of fine living. It offers a large variety of museums and architectural styles, from the Roman vestiges in Fourvière to the charming streets and “traboules” passageways of the Vieux-Lyon Renaissance district.

As one of the capital of French gastronomy, Lyon is also known for its typical “bouchon” restaurants, some of them being Michelin-starred.

You will find much useful information about what to do and what to eat in Lyon at <http://www.onlylyon.com/en/>

Public transport: Lyon has a dense network of public transport, buses, tramway and subway. You may find maps and practical information at <http://www.tcl.fr/en>

To get to the city center from the airport, you may take the Rhône Express train up to the Gare Part-Dieu train station, where you will find the subway (line B).

Programme

Thursday, June 6th

Salle de la Rotonde, 18 Rue Chevreul, 6th floor

- 9h30-10h **Coffe and opening (Salle de la Rotonde)**
- 10h-11h **Justin Biddle**
Epistemic Risk and Algorithmic Bias: Can Citizen Science Play a Role?
- 11h-11h30 **Elisa Vecchione**
Narratives for co-production: taking storylines in climate change seriously
- 11h30-12h **Fabienne Cazalis**
Autistic citizens and the science of autism
- 12h-13h30 **Lunch break (Salle de la Rotonde)**
- 13h30-14h30 **Kristina Rolin**
Objectivity: From Social Epistemology to Political Philosophy of Scientific Knowledge
- 14h30-15h **Alexander Christian and Christian Feldbacher-Escamilla**
Citizen science and social responsibilities of scientists
- 15h-15h30 **Vincenzo Politi**
Citizen Science through Science Education: reflections from RRI-Practice
- 15h30-15h50 **Coffe break (Salle de la Rotonde)**

15h50-16h20

Kristian H. Nielsen

Taking citizenship seriously in citizen science

16h20-16h50

Cristian Timmermann

Agricultural innovation and contributive justice: the multiple advantages of participation

16h50-17h50

Romain Julliard

Citizen science contributing to biodiversity monitoring: a French experience

18h-19h

Drinks (Salle de la Rotonde)

Friday, June 7th

Maison des sciences de l'homme, Salle Elise Rivet 14, avenue Berthelot

9h-10h

Florian Charvolin

Citizen science in the wild: How do accurate names of species appear in nature outings ? The case of a video shooting of an outdoor experience with the protocol "Biolit"

10h-10h30

Catherine Allamel-Raffin and Bernard Ancori

Objectivité, vérité et évaluation des savoirs dans les recherches participatives. Le cas de l'environnement

10h30-11h

Guillaume Bagnolini

Analysis of the ethos of an associative biohacking laboratory, the Myne at Lyon

11h-11h20

Coffee break (MSH, Cafétéria)

11h20-12h20

Denis Couvet

Citizen science and the ecological transition: new scientific issues

12h20-13h30

Lunch break (MSH, Cafétéria)

13h30-14h

Joao Cao Duarte

3D Model of an informal neighborhood as a citizen science dispositive

14h-14h30

Emeline Hassenforder, Nils Ferrand, Sabine Girard and Olivier Barreteau

Citizen Science for Public Decision Making and Social Change: when scientific objectivity is challenged

14h30-15h

Jean Masson

Hedonism, culture and economy versus human and environmental health stakes in viticulture. How about addressing this complex problematic with a participative-research-action?

15h-15h20

Coffe break (MSH, Cafétéria)

15h20-15h50

**Lionel Scotto d'Apollonia, Davia Dosias-Perla,
Pierre Camps and Thierry Poidras**

Participation is in the Air: a citizen magnetic-bio-monitoring technique to analyse concentration and origin of air pollutants up to decision making (PCAET)

15h50-16h20

Charlotte Coquard

Citizen participation in Science, towards a new contract Science-Society?

16h20-16h50

Saliha Hadna, Cyril Fiorini and Bertrand Bocquet

Méthodes de participation citoyenne dans l'expertise et la coproduction des connaissances

ABSTRACTS

Allamel-Raffin, C. and Ancori, B.

Objectivité, vérité et évaluation des savoirs dans les recherches participatives. Le cas de l'environnement

Les recherches participatives connaissent une très grande diversité de modalités, que l'on peut ranger entre deux extrémités d'un spectre selon la nature et le degré de participation des acteurs non académiques. A l'une de ses extrémités, ces derniers se contentent d'être de simples fournisseurs de données dans le cadre de recherches dont les protocoles, les conduites et les évaluations sont définis et pilotés par les seuls acteurs académiques à tous les stades du processus. A l'autre extrémité opposée, les acteurs académiques et non académiques sont idéalement placés sur un pied de stricte égalité depuis l'extrême amont de ce processus (définition et conception du sujet de la recherche) jusqu'à l'extrême aval de ce dernier (rendu et évaluation des livrables). Les questions épistémologiques les plus difficiles, donc les plus intéressantes, telles celles de l'objectivité, de la vérité, et de l'évaluation des produits issus de la montée en puissance récente des recherches participatives, se situent évidemment dans ce dernier cas — le cas opposé n'offrant, de ce point de vue, aucune difficulté nouvelle puisqu'il ne se distingue guère de celui des recherches académiques traditionnelles. C'est donc dans le cadre de cette modalité radicale des recherches participatives que nous traiterons du renouvellement des problématiques de l'objectivité, de la vérité et de l'évaluation des énoncés ainsi produits. Notre approche épistémologique se situe essentiellement sur un plan théorique, sans nous interdire de l'illustrer d'exemples issus du programme Repere (2009-2018) du ministère en charge de l'environnement. Nous commencerons par analyser le statut hybride des connaissances produites sur la base des connaissances scientifiques et à visée universelle des acteurs académiques combinées aux savoirs expérientiels, et souvent localement ancrés, des acteurs non académiques. Ces savoirs hybrides sont, à la lettre, transdisciplinaires. Pour mener cette analyse, nous rappellerons certaines caractéristiques des recherches pluri-, multi ou interdisciplinaires en ce qui concerne leur objectivité, le concept de vérité qu'elles font fonctionner, et le type d'évaluation qui leur convient. Nous comparerons ensuite ces caractéristiques à celles qui leur correspondent dans les recherches participatives envisagées au sens radical évoqué ci-dessus : existe-t-il de réelles différences en ces matières entre ces formes de recherche et les recherches non monodisciplinaires qui sont menées dans le monde académique. Si oui, s'agit-il de différences de nature ou de degré ? Nous concluons en évoquant les gains de productivité en termes d'informations et de connaissances nouvelles que l'on peut attendre du développement de cette forme de recherches participatives.

Bagnolini, G.

Analysis of the ethos of an associative biohacking laboratory, the Myne at Lyon

The biohacking movement or Do-It-Yourself Biology emerged in the USA at the turn of the new century with the development of synthetic biology, to spread rapidly worldwide thereafter. It is an amateur scientific movement that can be described as carrying out scientific and technical studies in

biology outside the framework of official institutions. Biohackers conduct their experiments at home, in their kitchen or garage, by turning them into laboratories. This is the case of the famous British biohacker Kay Aull who performed a genetic test on herself in 2009 by crafting a laboratory inside her closet at home¹. But for the most part, biohackers operate in collective laboratories taking different forms. Through physical interaction in these laboratories and during meetings, as well as communication on forums and websites, communal activities and practices started to take shape. As Sophia Roosth points out, these are political practices with anti-establishment elements against academic circles, government policies for scientific research, and the industrial economic system². I pose several questions: how does the practice of technical and scientific Do-It-Yourself lead to the construction of “new” norms and moral values? How is collective ethics articulated in a space like the Myne? In this presentation, I intend to focus specifically on the collaborative construction of *ethos* in one biohacking laboratory. In my thesis, I showed that the biohacking movement was shaped by several heterogenous influences resulting in a protean movement. I also showed the strong links that the movement maintains with certain streams of citizen science (especially the most critical and pragmatic approaches) even if they diverge in particular when it comes to their relationship with the institutions³. Biohacking also took up some aspects of the business models promoted by Silicon Valley, the culture of computer hackers, and the cyberpunk philosophy. The hybridization of these different cultures and movements ended up creating diverse collectives with varying values, policies and general organizations. Basing my research on the associative laboratory the Myne, I highlighted several important axiological categories in the construction of its *ethos*: contribution to the commons, sharing of knowledge, reappropriation of technical and scientific knowledge, sustainability, social diversity and commitment. I propose to detail these different axiological principles. The aim of this presentation is to lead – through a critical analysis of biohacking – to a broader reflection on citizens’ participation in techno-scientific choices and on policies concerning scientific and technical production.

Biddle, J.

Epistemic Risk and Algorithmic Bias: Can Citizen Science Play a Role?

As artificial intelligence (AI) becomes more and more pervasive in society, it is increasingly important to investigate the potential for algorithms to make biased decisions and to evaluate how these decisions might impact different stakeholders. In the United States, for example, risk assessment algorithms are increasingly being used in the criminal justice system to influence decisions about incarceration and criminal sentencing, and many have charged that these algorithms are biased against people of color. In this paper, I articulate a framework—epistemic risk—for thinking about the role of value judgments in the development and use of algorithms, and I argue that this framework helps to illustrate the ways in which algorithms can be biased. Additionally, I explore the ways in which citizen science could play a role in identifying algorithmic bias, including algorithmic bias in criminal sentencing.

Cazalis, F.

Autistic citizens and the science of autism

The rise of autism diagnosis, now estimated to concern between 1 and 2% of the population, has revealed that autism is one of the most heterogenous human categories. While the core dimensions of autism are always present, not two profiles are identical: manifestations of autism vary widely, not only between two individuals but also within the same person, depending on time and context. For this

reason, there is an immense variety of needs within the autistic population, and since this variety is poorly understood, it is difficult to address such needs and provide adequate support. Research has so far failed to identify factors that would allow categorization of individuals within the autistic spectrum. Moreover, there is a recent understanding that many autistic women denied diagnosis because they exhibit yet another kind of clinical presentation, often very discreet and therefore overlooked by professionals. In order to contribute to the solving of heterogeneity in autism, we propose the following principles that may bring a shift in the methods used to study autistic cognition:

1. Listen to/read what autistic persons think about autism.
2. Include autistic persons in the research team.
3. Avoid hypotheses that only target deficits in cognition, but rather favor hypotheses that target unusual cognitive performance.
4. Discuss chosen hypotheses with autistic individuals.
5. Assess the accessibility (language, colors, etc.) of the consenting process and study participation.
6. Favor methods that limit the stress of participating into studies, such as using online testing rather than having the participants physically come to the laboratory.
7. Favor measures that reflect everyday life performance by using ecological methods.
8. Allow autistic participants to provide critical feedback about the experiment, such as pointing unclear instructions or reporting stress levels induced by the experiment.
9. Avoid limiting participation based on “clinical categories” (such as so-called “low functioning autism”, Asperger syndrome, etc.), but rather include a variety of participants.
10. Include a large number of participants in order to maximize statistical power.
11. Include autistic individuals in the discussion of the results.
12. Recognize that autistic individuals are at high risk for abuse and discrimination and ensure that collected data is safe and private

We have implemented a minimalist version of those principles in an ongoing online study about autism in adult women. The research protocol was entirely designed by an autistic student. The person hired as a research assistant is also autistic. Participation is strictly anonymous. The protocol has been modified in order to take into account criticisms provided by the first series of participants. A full implementation of those principles is under development in the form of an online experimental system that will allow secure collection of identifying data. Ecological data collection will be made possible by the use of video games. The system will allow citizen contribution in every step (conception, realization, interpretation) of the scientific process so that Research can benefit from citizen insights.

Charvolin, F.

Citizen science in the wild: How do accurate names of species appear in nature outings ? The case of a video shooting of an outdoor experience with the protocol "Biolit"

Sociology of science has extensively studied laboratories and confined spaces loaded by instruments (Latour and Woolgar 1987). It has been underlined how these workplaces are resources for preparing and standardizing scientific results, in shop-talks and inscriptions. Little is however known of how this appearance of accurate results happen in an unconfined space (Callon, Lascoumes and Barthe 2001), or in a setting that can consist indifferently in high-tech environment or in the wild (Hutchins 1995). The communication will account for a video shooting of a nature outing in the case of the citizen science

protocol Biolit (conducted by the association Planète Mer), in Dinard, France. I will analyze the proper exercise proposed to a range of volunteers to go on the seashore and learn out to report seashells and algae, on a tally sheet, take photos of them, and, in order to do so, name the species encountered. Naming is in many respects the crucial product of nature outing, as important as "inscribing" in confined laboratories. Naming, according to Wittgenstein is a precondition to knowing what's next, and going on in the interaction; it is also for naturalists a way of having a better grasp over their environment and be joyful for that (Ellis 2011). What, then, is "naming" in the wild ? This specific activity in an outing, has at least two fitting characteristics: being scientifically accurate, and being socially adapted to the dynamics of interactions with people for whom the outing is also a leisure. I will describe the role of low-tech devices used to focus attention and organize volunteers' bodily behavior on site, as well as to assert the scientificity of data gathered in due process. Among them, quadrat (Kohler 2002) and drawing's sheets (Law and Lynch 1990) play a major role.

Christian, A. and Feldbacher-Escamilla, C.
Citizen science and social responsibilities of scientists

Since the mid-2000s, philosophers of science as well as scholars in science and technology studies have increasingly focused their attention on the participation of laypersons in research processes. Described as “citizen science” and “participatory science” (e.g. Irwin 1995, Curtis 2018), illustrate that the concepts of *citizenship* and *participation* might be essential to understanding the intricate relationships between scientists and laypersons in research settings and the varying degrees of agency laypersons participating in research processes have. One important research question in this context is whether the participation of laypersons affects the moral awareness and motivation of individual scientists and scientific communities when it comes to their professional as well as social and civic responsibilities. By participating in research processes laypersons might contribute more than their mere workforce – thereby contributing to the production of scientific knowledge – by affecting research agendas and the design of experiments and empirical studies. In this paper, we address the question of such an influence in two steps. First, we map the various ways in which laypersons can contribute to research processes; in order to do so, we distinguish several “parameters” relevant for such an interaction as, e.g., the epistemic and civic context, an underlying axiology, different agential roles, and various degrees of expertise. This allows us to draw a clear picture of several interaction-possibilities between science and society and prepares the ground for focusing on particular types of such interactions. In a second step, we discuss whether there is historical and contemporary evidence that in particular types of participation of laypersons in different areas of research processes fosters moral awareness and motivation to accept social responsibilities among scientists. By examining autobiographies and biographies of scientists (e.g. Archibald Cochrane) and systematically reviewing the literature on the association between the change of moral awareness and motivation of professional agents and the participation of laypersons in research we aim to substantiate the following thesis: A quite important and up to now only rarely investigated benefit of citizen science is that the participation of laypersons in research processes unintendedly and subtly fosters well-ordered science. This concerns particularly the mapping of societal preferences in research agendas and the consideration of nonscientific values in restricting research methods (cf. Kitcher 2001, Kitcher 2011). Yet different to approaches relying on institutionalized discourse situations bridging epistemic differences between laypersons and professional agents, citizen science brings about well-ordered science by mere participation of laypersons, their agency and the perception of laypersons as quasideers.

Coquard, C.

Citizen participation in Science, towards a new contract Science-Society?

Sciences Citoyennes has been created 15 years ago, by a group of researchers from various fields of humanities and natural sciences, along with students and citizens. Its main issue is to critically question the role of science and technology in the construction of a society and to put science into democracy so that it serves the common good. This talk aims at showing in a first part a bigger and political perspective from the point of view of a civil society organisation, rather than a scientific view, reflecting on the workshop question: *how does participation of citizens in science affects science objectivity?* We will firstly intend to discuss the following question: What means scientific objectivity, scientific rigour or neutrality? To answer, the two principles of freedom and accountability, exposed in Sciences Citoyennes Manifesto for a Responsible Scientific Research, will be discussed. Originally seen as a protector principle, academic freedom was a social contract allowing the quest of knowledge for knowledge with no accountability on the consequences. This reflects to the assumed existence of a neutral science and independent research, with the belief that science necessarily contributes to the progress of humanity. However, several authors reject the concept of « neutral » science or « the ideal of value-free science » (K. Bschor). We believe that this conception of science has historically permitted and permits today more than ever, dominant actors, classes and nations, to control the orientation and the utilisation of science, nowadays also strongly manipulated in the current economic rush. Within the extreme severity of the climate change context, we call for accountability of science. In a second part, we will expose how participatory research is one way of fostering science accountability and making sense for searchers. We call for democratization, opening and reflexivity of the world of research, and participatory research plays an important role for this new contract between science and society: it participates to the “decolonization” of knowledge by legitimizing lay people’s knowledge (B.L. Hall, R.Tandon, 2017) (1); It fosters a scientific production dedicated to the common good (2); it influences the research programming, thus democratizing scientific research (and therefore technical applications of science) (3). However, participatory research is more likely to have this effect if citizen participation is understood as a co-production of knowledge, from the very definition of the scientific question and hypothesis, to the valorisation of results (Callon, Lascoumes, Barthe, 2001). Participation in research will be analysed with the help of Arnstein scale of participation in democracy in this third part. Through the example of participative selection of wheat varieties, we will explain in a tangible manner the co-production of knowledge, the benefits for both research and society, and its potential to orientate science towards the common good.

Couvet, D.

Citizen science and the ecological transition: new scientific issues

Citizen science contributes to address three major issues associated to the ecological transition.

1. Developing relevant systems to observe the environment

These ought to assess the multiplicity of environmental variables that might matter, especially in regards to biodiversity.

Citizen observatories indeed respond to a social demand; they fuel for example the ' common birds '

indicator is one of the 12 indicators of sustainable development in the EU.

Bringing a wealth of data, far beyond what is the standard in ecology, significant scientific development, in terms of methods of observation, statistical analyses, accompany these citizen observatories.

2. Fostering relevant innovations, combining technological and social possibilities

Citizen innovation platforms should enrich the diversity of social actors involved in the development of innovations', working on their compatibility, relevance, with present and future diverse social practices. That may involve the ' nudging ', or (re)-construction of the complex architecture of individual choices, beyond the rationality of Homo economicus or Homo sociologicus.

3. Reinforcing deliberative democracy

A major challenge is to improve interaction between antagonist stakeholders, diversifying the options, their multi-dimensionality, reducing tensions associated to decision-making. That includes multi-agent common property management models (e.g. Comods), standardized ways to identify entities, processes, which matter for different stakeholders in complex anthropo-ecosystems (e.g. ' geo-Bon Ecopotential '). Such methods bring new ways to consider social-ecological complexity, including a diversity of world-views, values. We will conclude on the necessary collective organization of participants, on the challenge of interactions between different kinds of knowledge, from scientific to vernacular, including practitioner's, the necessary consilience required to combine with the often divergent logics of the different scientific disciplines.

Duarte, J. C

3D Model of an informal neighborhood as a citizen science dispositive

The citizen science project Novos Decisores Ciências is studying the Portuguese Tagus Estuary morphological changes and flooding events during storms with local inhabitants and Coastal Geology and Oceanography researchers. This project is part of the *Nouveaux Commanditaires Sciences* network and has been taking place for the past five years. It started out with a protocol of non-formal education between mediators and a group of young inhabitants, looking for questions, discussing and sorting these out, searching for a problem that could have the potential to be a ground for novel research. The present research is anchored in this physical territory, specifically Segundo Torrão, an informal settlement in the banks of this Estuary with more than 75 years of history and more than 3'000 inhabitants, mostly migrants. In-between the land and the sea, these individuals have their life punctuated by menacing extreme events. Academic science, in this case, is engaged, implicated, mobilized into a concrete place and its inhabitants. How does this relation transforms the academic science? This presentation focus upon the social process of objective data collection. An object, a participative dispositive was brought forward in the Summer of 2016: a 3D architectural model of the neighborhood. It was built, first of all, to collect data on coastal changes by a team of mediators. It fitted that end by adding cardboard pieces or drawing with paint markers. The ethnographic research is based upon the precise description of the moments of interaction between mediators and inhabitants, based upon observations and semi-directive interviews, having such object as an intermediary. This 3D model fits as an iconographic participation tool, eventually being part of a 'semiotic turn' in social participation, as elements were there accumulated in the object itself, as part of the heuristic path of the *in-situ* data collection. But here is argued that the data collection couldn't be disclosed without its political dimension. Using situated ethnography of the social participation with the philosophical semiotic tools developed by Charles Sanders Peirce, it becomes apparent how the heuristics of scientific research are intertwined to the community development. Elements of the 3D model of the

neighborhood served as *index* to past events of sea invasion. But, to tackle the most significant of such events, community members evoke other objects, as pictures and newspaper articles, engage in dissent over the chronological sequence and claim the flooding as *symbol* of community organisation.

Hadna, S., Fiorini, C. and Bocquet, B.

Méthodes de participation citoyenne dans l'expertise et la coproduction des connaissances

Les sciences et recherches participatives s'étendent sur des domaines scientifiques larges avec des parties prenantes très diversifiées. Une caractéristique commune à ces démarches est la qualité apportée dans le processus de recherche. Nous nous intéressons ici aux méthodes et outils mobilisés par un « public concerné » dans le domaine de la contre-expertise et de la co-production des connaissances. Nous étudierons trois configurations de la participation citoyenne à la production des connaissances : (i) l'appropriation de capteurs de mesure par une association soutenue par la CRIIRAD ; (ii) la convergence d'une association de lutte contre la pauvreté avec le monde académique ; (iii) la co-construction de problématiques de recherche entre chercheurs et société civile. Nous examinerons les rapports entre les parties prenantes impliquées dans ces processus. Comment se construisent-ils et quels sont les mécanismes de légitimité des productions face aux processus « traditionnels » ? Cette intervention du public pose-t-elle des questions d'ordre épistémique ? Depuis une quarantaine d'années, l'expertise connaît une forte remise en question (Lévy-Leblond, 1977 ; Horlick-Jones & De Marchi, 1995 ; Granjou, 2003 ; Collins, 2014). Cette dernière s'illustre par le rôle accru du public dans la production de données scientifiques en revêtant un caractère actif et participant au renouvellement de la démocratie. À Piriac-sur-Mer, des riverains inquiets des effets des stériles uranifères sur leur santé ont récemment décidé d'acquérir un détecteur gamma de prospection pour réaliser des mesures de radioactivité dans leur commune. Cette initiative pose la question centrale de la légitimité des connaissances produites. Dans le cadre du programme de recherche expérimental « Quart Monde – Université » (1996-1998), universitaires, personnes en situation de pauvreté et membres actifs de l'association ATD Quart Monde ont co-produit des savoirs nouveaux qui ont trouvé place dans la production d'un ouvrage co-écrit. Ce processus de deux ans s'est appuyé sur une méthodologie complexe liant groupes de pairs, groupes mixtes thématiques, séminaires de trois jours en plénière, animation assurée par une équipe pédagogique et évaluation par un conseil scientifique (Michel Serres, René Rémond...). Cette recherche a inspiré le « croisement des savoirs » qu'ATD Quart Monde pratique depuis 20 ans. Les partenariats de recherche coopérative chercheur-acteur revêtent aussi des formes plus institutionnalisées par des programmes dédiés ou des dispositifs stables comme les Boutiques des Sciences (Bocquet, 2018). Les contextes de recherche et d'action demandés par l'un et l'autre des partenaires nécessitent des développements méthodologiques spécifiques. Nous développons actuellement une méthodologie de Recherche Action Participative (Chevalier et Buckles, 2013 ; Blangy et al., 2018) qui réunit six équipes dans six villes différentes pour examiner et prolonger des initiatives de collectifs engagés dans la transition énergétique.

Hassenforder, E., Ferrand, N., Girard, S. and Barreteau, O.

Citizen Science for Public Decision Making and Social Change: when scientific objectivity is challenged

Citizen sciences are often 'extractive' in that they involve citizens in order to collect data useful to science. We consider citizen science more broadly, with a research-action stance, and aiming to collect data that is useful not only to scientists, but also to policymakers, politicians and citizens themselves. In

this perspective, the question of objectivity is placed at the heart of a dialogue between different actors coming from different scientific disciplines, but also from other areas of society. Here, objectivity must guarantee a decision-making process that is ‘enlightened’ (i.e. informed) and serves the common good. The communication proposed here is based on several experiences of participatory research projects in the field of water led by the authors and pertaining to this paradigm. These experiences rely on associating citizens and other actors in the subsequent decision-making steps of a plan, project or program: from diagnosis to implementation, through the identification of objectives, planning, foresight and the choice of actions (CoOPLAaGE approach). Actors are notably involved in the framing of the process itself as well as its monitoring and evaluation. In other words, they define who will be involved when and with what role and what data they will need when and in what format. In this sense, they are invited to discuss the role of scientific expertise in the decision-making process and the data they need to participate in an informed way. This reflection is anchored in the fields of research on the engineering of participation as well as on policy analytics. Two experiences will be highlighted: the SPARE project in Drôme (2015-2018) and the PACTE project (2018-2022) in Tunisia. In Drôme, the aim was to allow citizens to make proposals ahead of the revision of the Water Management Plan (SAGE). Citizens have thus participated in the engineering of the participatory process itself, with the underlying assumption of their empowerment and increased ownership of the process. In fact, if this hypothesis has been verified, it has also led citizens to question the very expertise of researchers on participation and to require the extreme transparency of all data produced and analyzed. In Tunisia, conversely, the sharing of the expectations of the various actors vis-à-vis the production of knowledge related to the participatory process revealed a refocusing on the scientific authority underpinned by a vision of necessary partition of roles and skills. In conclusion, rather than questioning ‘what form the implication of citizens should take in order to optimize the epistemological conditions of scientific objectivity?’, this communication proposes to return this question and ask: ‘what form should citizen sciences take in order to optimize the epistemological conditions of an enlightened decision?’.

Juillard, R.

Citizen science contributing to biodiversity monitoring: a French experience

Over the last 20 years, I have taken part in the rise and popularization of citizen science in the field of biodiversity through the program “Vigie-nature” of the Muséum national d’Histoire naturelle, now including 15 different citizen science projects implicating various observer networks. Besides the scientific valorization in ecology, many social science researches have also been conducted studying the various consequences of citizen science on participants and stakeholders. Through various examples of success (and failures), I will point out what we have learned and our current vision for the development of citizen science and of their full transformative potential.

Masson, J.

Hedonism, culture and economy versus human and environmental health stakes in viticulture. How about addressing this complex problematic with a participative-research-action?

Vines are grown on 9 million hectares worldwide, with conventional, organic and biodynamic practices (90%, 9% and 1%, respectively). Critics from society against viticulture impacts on human and environmental health are raising high. Furthermore, at the same time, winegrowers are experiencing climatic disorders, reinforcing constraints the viticulture is facing. This rather tensed situation is increasing the dissensus between stakeholders from viticulture’s community, as well as those with society. It challenges knowledge’s and contributes to slow motion changes if not *status quo*. Aiming to

answer these numerous constraints, and unlocking this complex problematic, we laid a participative-action-research (PAR so called REPERE) involving a large panel of stakeholders. Workshops highlighted dissensus between winegrowers, according to their practices, as well as between environmental NGO, advisors, and scientists too, from either agronomic or human fields. These dissensus relied on distinct proof registers, specific to each stakeholder. They also revealed epistemic conflicts, as well as quests for legitimacy. The RAP group developed its own epistemology. This allowed for partial consensus building on very much debated subjects such as vine health, life in soils, and beyond, on viticulture practices. All stakeholders from RAP were involved in the coconstruction of co-eco-formations. These later allowed us capturing all data produced, in agronomic and human fields, out of the experiments conducted together. This led to a shared understanding in the course of a 5-year RAP project. We will illustrate how the collective epistemology, appealing for a transdisciplinarity, together with *ad hoc* workshops, helped the group raising its consensus statement. Altogether, this RAP suggests that dissensus can shift from constraint status to advantageous resource for action and innovation. From the stake on, until scientific paper writing, all group members contribute, as this RAP was developed for. Beyond consensus statement, we produced knowledge, which was ultimately legitimated by scientific community. Later, we together designed the next questions, prioritized them, and enrolled new winegrowers from France, Germany and Switzerland to consolidate the experimental scheme, as well as to broaden pedoclimatic conditions together with knowledge. As this RAP is expanding, true changes in the vineyards with lower environmental impact viticulture are being developed at large scale, together with engagement of new winegrowers. Yet, the legitimacy of this RAP was never that fragile. What about contribution of epistemology and transdisciplinarity to help this seedling grow?

Nielsen, K. H.

Taking citizenship seriously in citizen science

Citizen science offers new modes of collaboration and association in science and society. Citizen science initiatives may include citizens in defining and/or prioritizing research topics, or in data collection, data interpretation and communication of scientific results. As per definition, citizen science has to fulfill scientific objectives while also enacting specific aspects of citizenship. However, scientists who more often than citizens define what citizen science really accomplishes tend to take for granted or disregard notions of citizenship. This paper engages empirically and conceptually with the ways in which citizen science initiatives construct “the citizen” and thus enact citizenship. Citizen science, along with public dialogue and public participation in science, has gained much attention from scientists, science managers and policy-makers. Yet, it is far from clear just how many citizens are actually getting involved and for what reasons. Surveys of science driven citizen science projects find that a minority does the majority of citizen science work and that science interests are what motivate most to participate. As citizens, individuals have different kinds of relationships to science as a social institution in which different forms of citizenship is involved. Citizens may rely on scientific knowledge to form opinions, inform decisions, or carry out political activism and community organizing. Citizens also may use science for general information and entertainment, and they, as taxpayers, ultimately are patrons of science conducted in public research institutions. In most countries, citizens generally trust the institution of science, although controversial cases may induce public distrust in science. Citizen science initiatives not only serve science, but also, more or less explicitly, enact different types of citizenship from public participation in science through public governance of science and science-based activism and thus in various ways mediate trust relationships between

scientists and citizens. The empirical part of the paper looks at three citizen science initiatives in Denmark:

- Bioversitet Nu (Biodiversity Now), allegedly the largest citizen science project in Denmark, where citizens use an app to collect information about selected species and habitats
- Et Sundere Syddanmark (A Healthier Southern Denmark), where the region of Southern Denmark in collaboration with the university hospital challenges citizen to allocate 2 million DKK (270.000 Euro) for two out of five health-related research projects
- Arternes Aarhus (Aarhus of the species), where a group of citizens in the city of Aarhus, in collaboration with the local Natural Museum, organize events (often humorous) to create public awareness about urban biodiversity and inform local policies

The paper concludes that citizen science initiatives enact very different aspects of citizenship from enrolling citizens as part of scientific projects to asking citizens to partake in science governance and implicating science in more or less overt political discussions. The current emphasis on citizen science tends to overemphasize citizen science as public participation in science and thus underplay the potential of citizen science to enact more than just one aspect of citizenship.

Politi, V.

Citizen Science through Science Education: reflections from RRI-Practice

In the same way in which there cannot be proper democracy without education, so there cannot be proper citizen science without science education. However, the crucial role of science education is not often appreciated by those who auspicate institutional changes in favour of a more open and participatory model of science. Some may fear, moreover, that a ‘strong’ science education for everybody may lead to widespread conformism and reduce the plurality of different epistemic standpoints, thus undermining the idea of citizen science at its very basis. In this talk, I will tackle these two problems. In the first part, I suggest a reconceptualization of science education in a way which clarifies how it could play a crucial role for the realization of citizen science. The argument developed in this talk is based on the findings of the on-going EU Horizon2020 project “RRI-Practice”. Responsible Research and Innovation (RRI) is a concept promoted by EU research and innovation policy which “implies that societal actors (researchers, citizens, policy makers, business, third sector organisations, etc.) work together during the whole research and innovation process in order to better align both the process and its outcomes with the values, needs and expectations of society”(<https://ec.europa.eu/programmes/horizon2020/en/h2020-section/responsible-research-innovation>). RRI is a key action of the EU ‘Science with and for Society’ objective, and aims at building stronger ties between science and society: apart from being excellent or useful, in fact, “responsible research” must address societal needs and reflect on the potential impact of science and technology on society. As defined within the EU project, RRI consists of five keys: ethics, gender equality, open access, public engagement and science education. As emerges from the examination of the twelve case studies produced by nations taking part to the project, science education is conceived as the teaching of science and technology. This key is driven by the desire of raising the scientific, technological and, therefore, also economical profile of a nation through the improvement of STEM curricula. Although its importance is globally recognised, science education is regarded as a stand alone activity of schools and universities, and its inclusion as one of the RRI keys is often questioned, if not contested. I will argue that the aims of science education should be reconceptualized. Science education should not be conceived just as the mere teaching of STEM knowledge and skills. Rather, science education should be regarded as aiming at a general cultural change. I will also show how this aim does not conflict with

the desire of raising the scientific, technological and economical profile of a nation. In the second part of the talk, I will explain why a “science education for all”-model does not hamper the plurality of epistemological perspectives which is welcomed, and is indeed at the basis, of the idea of citizen science.

Rolin, K.

Objectivity: From Social Epistemology to Political Philosophy of Scientific Knowledge

I argue that scientific objectivity is a hybrid ideal with both an epistemic and a moral-political dimension. Whereas the epistemic dimension of objectivity has received attention in social epistemology (e.g., Douglas 2009; Longino 1990; Koskinen 2019), the moral-political dimension is in need of clarification. The moral-political dimension tells us what makes scientific knowledge claims socially responsible. Scientific knowledge claims are socially responsible when scientists have arrived at them in part by following sound moral and social values in different stages of scientific inquiry. Given that moral and social values can legitimately play different roles in scientific inquiry, the challenge is to understand how scientists can identify sound moral and social values. In my presentation, I discuss the strengths and weaknesses of different approaches to this question.

Scotto d'Apollonia, L., Dosias-Perla, D., Camps, P. and Poidras, T.

Participation is in the Air: a citizen magnetic-bio-monitoring technique to analyse concentration and origin of air pollutants up to decision making (PCAET)

The BREATHE project (Scotto d'Apollonia et al., 2019) mobilizes an innovative device called Artivistes-atelier (AA) (Scotto d'Apollonia, Dosias-Perla, 2017;) to articulate a Participatory Action Research (RAP) program on political decision making (Dosias-Perla et al., 2018) and Citizen Sciences (SC) one on the air quality issues. The chosen common thread is a citizen measurement of the concentration of air pollutants deposits in urban and peri-urban areas. In 2019, a double deep deficit of citizen mobilization (Blondiaux, Fourniau, 2011) and effectiveness of public policies (Charvolin et al. 2015; Zittoun, 2009) persists. The European community takes France and five other members states to EU Court of Justice for failure in their air quality policies. We will present how an interdisciplinary research program provides concrete answers to this complex problem with a pragmatic critical and reflexive approach. In this way the BREATHE project permits to integrate citizens in all the modus operandi: from the metrology in his backyard to multi-actors groups to political decision making. The deliverable is to co-produce with citizens high-resolution maps of the deposits of anthropogenic toxic metals on plant leaves doubled with passive filters. Our challenge is the calibration of the measured parameters obtained from environmental magnetism techniques in accordance with current European standards on the metrology of atmospheric pollutants. To reach this objective, we designed and built an experimental wind tunnel in which analogue modelling of metal deposition of known concentrations, at different wind speeds, and on different local plant species are carried out. We will draw the co-construction of BREATHE project which begins with a bio-metrology exploratory study following citizen mobilization in Montpellier to improve air quality by the construction on the fifth tramway line (Camps et al., 2016). Then it follows a citizen mobilization in an eastern Montpellier (France) city called Saint-Aunès provoked by a program intending to expand the expressway. We will present some first significant results and develop then the benefits and limitations identified which emerged during its deployment. We aim to feed the debate for scholarly dialogue and interdisciplinary exchange.

Timmerman, C.

Agricultural innovation and contributive justice: the multiple advantages of participation

Engaging farmers in science projects has a number of epistemic benefits in terms of improving scientific outcomes and adjusting research to develop technological solutions that are likelier to be used. Yet the focus on scientific objectivity of citizens (or farmers) science projects, shifts to the background crucial social justice related issues of increasing participation. The major contribution to welfare scientific advancement in agriculture makes is only one of the relevant social justice factors. On hand of the concept of contributive justice I explore the multiple advantages of participatory research environments, such as: (1) the intrinsic benefits of participation, (2) the opportunity to learn skills and improve productivity, (3) empowerment, allowing people to contribute to social welfare, (4) shifting positions of dependency to mutual influence, and (5) social recognition. In agriculture inclusive science projects give farmers a sense of belongingness and allow to satisfy curiosity. The learning of new skills allows farmers to reduce their dependency on external inputs, practice more sustainable alternatives and increase harvest yields. Participation gives farmers an opportunity to improve their communities' welfare and a voice in directing research towards community priorities. Moreover, when research projects take participation seriously, farmers will be able to contribute to the projects with their findings and observations, instead of being merely receptors of end-products. Lastly, a scientific and social valorisation of farmers' knowledge contributes towards their recognition.

Vecchione, E.

Narratives for co-production: taking storylines in climate change seriously

This talk addresses the problem of incorporating non-epistemic values into mathematical modelling of climate change. Models in general, are seen as exemplary of that blurring distinction between science and policy, facts and values, epistemic and non-epistemic values that STS has long denounced (Svetlova and Dirksen, 2014). However, few studies exist on how non-epistemic values are incorporated in modelling future scenarios (Mayer et al 2017) and how they contribute to new experiences of knowledge co-production (Landström et al., 2011; Lane, Landström, & Whatmore, 2011). Virtually no study exists on how co-production is operationalised by scientists, that is, whether their instruments are epistemically and methodologically calibrated to engage in co-production and to what extent these instruments enable managing the tension between epistemic and nonepistemic values in a purposeful way. Therefore, this talk takes its premises from a recently submitted paper on knowledge coproduction from the perspective of a general modeller. The paper demonstrates that one of the common methodologies used for modelling climate change mitigation -i.e. the classical sequential approach based on well-defined probabilities – is not calibrated for resolving the tensions between epistemic and non-epistemic values, thus presents serious limitations for implementing a co-production approach to knowledge. The paper identifies in the neglect of moral values and moral discussion the most serious limitation to knowledge coproduction and accordingly, presents an epistemic framework in which the moral component of knowledge could be integrated. The talks will then move on by operationalizing this framework within a methodology based on narratives. This choice needs not be considered totally novel, as the IPCC itself officially employs the concept of narratives and storylines to account for the different stages or plots in which society may find itself in the future. The difference of the approach I suggest, however, lies in that the moral connotation of how

action would develop in such stages will be considered – as opposed in the IPCC narratives in which this is deliberately dismissed. Such moral connotation will directly be searched in the way storylines are assembled by building continuities between events, that is, by identifying and flattening the uncertainty separating events. This is arguably an operation of imagination built into the science of mathematical modelling which needs to be made explicit and rendered its purposeful value of reifying future events. In order to do this, the talks will argue in favour of looking at climate storylines as ‘histories of the future’ and, accordingly, analysing them retrospectively as if their sense resided in them being brought to a closure, or an end. The duality between history and story and the idea that the end of a story carries a moral value, are directly borrowed by Hayden White’s theory of narrativity and application to historiography (1987). His theory will therefore instruct my new approach to the analysis of climate change narratives and be reflected upon as a way to posit the following question: can narrative be the basis of the scientific method?

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