Institut Henri Poincaré

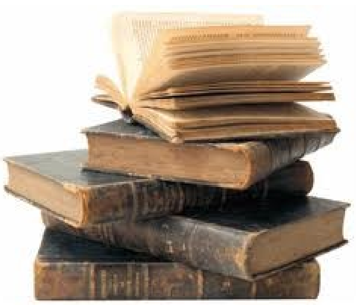
Faculté de Mathématiques UFR 929

Institut de Mathématiques de Jussieu (UMR 7586)

NOVEMBERTAGUNG 2011

Theme : Collectives in mathematical practices

Invited speaker : Frédéric Brechenmacher



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Novembertagung 2011 : Participants			
Name	**Mail**	**City**	**PHD Subject**
Alvarez Polo, Yolima	yolima.alvarez@alum.unirioja.es	La Rioja	History of Linear Algebra
Benediktova, Marie	marie.benediktova@gmail.com	West Bohemia	Correspondence of C. F. Gauss
Blasjo, Viktor	v.n.e.blasjo@uu.nl	Utrecht	The Representation of Transcendental Curves in the Early Calculus
Boucard, Jenny	jenny.boucard@gmail.com	Paris	Un « rapprochement curieux entre l'algèbre et la théorie des nombres » : études sur l'utilisation des résidus et des congruences entre 1801 et 1850
Chang, Fu-Kai	akyetttt@gmail.com	Mainz	A Reassessment of David Hilbert's Work on the Foundations of Geometry
Cogliati, Alberto	alberto.cogliati@unimi.it	Milano	Continuous groups of transformations: Cartan's structural theory (1893-1910)
Cousin, Marion	cousin_marion@yahoo.fr	Lyon	L'enseignement de la géométrie durant l'ère Meiji.
Cretney, Rosanna	rosie@cretney.net	The Open University	The correspondence of Leonhard Euler
Daudon Vincent	v.daudon@laposte.net	Paris	Comment le temps est devenu une variable indépendante privilégiée de la philosophie naturelle aux XVII-XVIII° siècle ?
Dupond, Marie	dupondmarie@me.com	Athens & Paris	The correspondence of Gaspard Monge 1795-1799 : the mathematical perspective of the social engagement of a geometer during the French Revolution
Durand, Antonin	antonin.durand@ens.fr	Paris	“Fare la matematica italiana” : Italian Mathematicians in Politics during the Risorgiment
Eckes, Christophe	eckes@math.univ-lyon1.fr	Lyon	Groupes, invariants et géométries dans l'oeuvre de Weyl
Fariba Ellie	ellieef@gmail.com	Wuppertal	Introduction of modern mathematics at the beginning of 20th century in Iran
Ikonicoff, Roman	r.ikonicoff@free.fr	Paris	Penser la notion d'effectivité. Naissance de la notion chez Emile Borel
Kaufholz, Eva	kaufholz@uni-mainz.de	Mainz	Sofja Kowalewskaja - A historic contextualisation
Kranz, Philipp	philipp.kranz@gmx.de	Mainz	Mathematicians at German Universities, ca. 1930 to 1951
Kröger, Desiree	mizzdee84@googlemail.com	Wuppertal	Traditionen der schriftlichen Mathematik
Lê François	francois.le@ens-lyon.org	Paris	Rencontre de la géométrie projective et de l'analyse algébrique arithmétique au 19ème siècle.
Lémonon Isabelle	ilemonon@gmail.com	Paris	Autour des femmes de science au XVIIIe siècle
Lorenat, Jemma	jlorenat@sfu.ca	Vancouver	History of Mathematics
Monteiro de Siqueira, Rogério	rogerms@usp.br	Sao Paulo	Modernism, Modernity and Modernization in Brazilian mathematical sciences
Morel, Thomas	thomas.morel@u-bordeaux1.fr	Bordeaux	Les mathématiques en Saxe de 1780 à 1850 : Evolution de la discipline, analyse des politiques scientifiques et des réformes institutionnelles
Mrozik, Dagmar	dagmar.mrozik@googlemail.com	Wuppertal	Traditionen der schriftlichen Mathematik und Mathematikvermittlung im deutschen und im französischen Sprachraum zwischen 1650 und 1820
Paumier, Anne-Sandrine	annesandrine.paumier@gmail.com	Paris	Laurent Schwartz et la vie collective des mathématiques
Preveraud, Thomas	thomaspreveraud@yahoo.com	Nantes	Circulations mathématiques franco-américaines (1818-1878)
Ramirez, Alfredo	ramirez@math.uni-wuppertal.de	Wuppertal	Early History of Symplectic Geometry
Reimann Katrin	reimannk@smail.uni-koeln.de	Köln	Problems from pupil in mathematics in the change from arithmetic to algebra
Turner, Laura	lturner@ivs.au.dk	Aarhus	Images, Identities, and Mathematics in an International Space : Roles of Gösta Mittag-Leffler in the Development and Internationalization of Mathematics in Sweden and Abroad, 1881-1927
Viertel, Klaus	klaus.viertel@googlemail.com	Bielefeld	Gleichmäßige konvergenz im 19. jahrhundert
Zheng, Fanglei	fl.zheng@gmail.com	Paris	L'analyse des problèmes sur les nombres au moyen age -- De Numeris Datis ou Data Arithmétiques de Jordanus de Nemore

Wednesday, November 2nd

19:00 **Welcome to the Centre International de Séjours de Paris (CISP)**
We will wait for the arrival of those who have booked a room with dinner and drinks.

Address : CISP Kellerman, 17 boulevard Kellerman, 75013 PARIS
Nearest subway : Metro Ligne 7, Porte d'Italie
Please tell us in advance if you really can not arrive before 10 pm, so that we can leave your keys somewhere !

Thursday, November 3rd

08:30 **Welcome at the Institut Henri Poincaré (IHP) + Introductive Discussion**
Address : 11, rue Pierre et Marie Curie, 75 005 Paris

SESSION 1 : COLLECTIVES AND BOOKS

09:30 **Chang, Fu-Kai**
A Reassessment of David Hilbert's work

10:00 **Monteiro de Siqueira, Rogério**
From Oslo to Rome : The volumes of geometry in the Enzyklopädie of Felix Klein

10:30 **Coffee Break**

11:00 **Alvarez Polo, Yolima**
Algebra in a course of Analysis by Beppo Levi (1916)

11:30 **Eckes, Christophe**
Weyl's monography on quantum mechanics (1928-1931) : its situation in the mathematization of quantum mechanics as a collective process (1925-1931)

12:00 **Collective discussion** around the session theme

12:30 - 14:00 **Lunch Break** (IHP)

SESSION 2 : COLLECTIVES AND JOURNALS

14 :00 **Morel, Thomas**
Collective practices in the mathematical journals of Carl Friedrich Hindenburg (1781-1800)

14:30 **Préveraud, Thomas**
Mathematical Press in Europ and in New York (1824-1826)

15:00 **Collective discussion** around the session theme

15:30 **Coffee Break**

16:00 **Frédéric Brechenmacher**

16:30 **Global Discussion** around extracts of *The Shaping of Arithmetic after C. F. Gauss's Disquisitiones arithmeticae*

19:30 **Dinner** (CISP – for participants who asked for)

Friday, November 4th

SESSION 3 : COLLECTIVES AND SOCIETIES, SCHOOLS, CONGRESSES...

09:00	**Lê, François** *On the 27 lines upon the cubic surface*
09:30	**Lorenat, Jemma** *From Oslo to Rome : The volumes of geometry in the Enzyklopädie of Felix Klein*
10:00	Coffee Break
10:30	**Ramirez, Alfredo** *An early collective history of Symplectic Geometry*
11:00	**Viertel, Klaus** *The History of uniform convergence or "was there a fourth man..." ?*
11 :30	Collective discussion around the session theme
12:30 - 14:00	Lunch Break (IHP)

SESSION 4 : COLLECTIVES AND CORRESPONDANCE

14 :00	**Dupond, Marie** *Issues of the "collective" in the idea of progress of mathematicians in the second part of the 18th century...*
14:30	**Cretney, Rosanna** *Euler's correspondance*
15:00	**Benediktova, Marie** *Gauss's Differential Geometry in Letters with his Students*
15:30	**Collective discussion** around the session theme
16:00	**Coffee Break**
16:30	**Global Discussion** around the words to speak about « collectives » in different languages
19:30	**Dinner** (CISP – for participants who asked for)

Saturday, November 5th

SESSION 5 : MATHEMATICAL COLLECTIVES

09:00	**Cousin, Marion** *Tokyo Mathematical Society and its influence in translating the logical concepts*
09:30	**Durand, Antonin** *How the Italian National Building Influenced the Mathematical Practices (1839-1914)*
10:00	**Kaufholz, Eva** *A new perspective on mathematical schools*
10:30	**Coffee Break**
11:00	**Turner, Laura** *Mittag-Leffler and the Scandinavian Congress of Mathematicians*
11 :30	**Kranz, Philipp** *Mathematicians in Germany after World War II: The early history of Oberwolfach*
12:00	**Collective discussion** around the session theme
12:30 - 14:00	**Lunch Break** (IHP)

SESSION 6 : THE LAST BUT NOT THE LEAST

14 :00	**Ikonicoff, Roman** *A notion of Effectivity in E. Borel (1900-1905) based on intersubjectivity*
14:40	**Daudon, Vincent** *First and Ultimate Ratios, a personal or collective undertaking ?*
15:20	**Elliee, Fariba** *Hachtroudi and weylian connection*
16:00	**Coffee Break**
16:20	**Collective discussion** around the session theme **Final Discussion** : Novembertagung 2011 ends and Novembertagung 2012 begins
19:30	**Conference Dinner**

ABSTRACTS

Alvarez Polo, Yolima : ***Algebra in a course of Analysis by Beppo Levi (1916)***

At the beginning of 20th century the topics of algebra are studied in Europe into courses of mathematical analysis, sometimes with the name of algebraic analysis. What we understand for algebra here is basic arithmetic, linear algebra at that time, polynomials and algebraic equations. In Spain, these issues were part of the content of the subjects Mathematical Analysis 1 and 2. Julio Rey Pastor (1888-1962) explained these courses in Madrid from 1914-1915 on, and he published the book titled Elementos de análisis algebraico (1917), wherein the author introduces a new orientation with respect to his Spanish predecessors. This book was inspired by Istituzioni di analisi algebrica (2nd ed. 1909) by Alfredo Capelli (1855-1910). Rey Pastor refers to some similar treatises that served him as guide. Among them we found Introduzione alla analisi matematica (1916) written by Beppo Levi (1875-1961), which is very close to Elementos in its publication date. On the other hand its treatment of algebra is very different from that adopted by Rey Pastor. Levi stated an abstract algebra while Rey Pastor focused algebra always relative to numbers. The aim of this work is to describe the content in Introduzione. We will consider the modernity of the book in a time of transition towards the algebraic structures.

Benediktova, Marie : ***Gauss's Differential Geometry in Letters with his Students***

The talk is to point on Gauss' work in the letters between C. F. Gauss and his students and collegues, mainly H. C. Schumacher. It is focused on motivation and background of the Gauss papers that are elements of the differential geometry. It is directly connected to the theme "Collective in mathematical practices" through a new idea of (theoretical and applied) mathematics as a part of interdisciplinary engineering practices. It will be mainly pointed on a personal and collective approach in the (applied) mathematics of the 1820s.

Chang, Fu-Kai : ***A Reassessment of David Hilbert's Work on the Foundations of Geometry***

In his *Grundlagen der Geometrie,* David Hilbert (1862-1943) famously recast the foundations of Euclidean geometry by means of a modern axiomatic approach. It has long been regarded as marking one of the most prominent milestones on the road from classical to modern mathematics. Yet while the importance of Hilbert's work for axiomatics has long been clear, a number of other important questions arise when examining it more closely and in connection with a different line of historical developments. Since there is still no research focusing on these other aspects, my intention is to show not only the immediate context that led to Hilbert's work but also its longer term implications for geometrical problem solving, a tradition of great significance for the history of mathematics. This approach involves a reassessment of the motivation behind his research as well as its larger place within the history of mathematics.
Although my research will deal with other important work in geometry during the 1890s, its main focus will be on Hilbert's lecture course "Elements of Euclidean Geometry" (1898-99) and the famous *Festschrift* article he wrote immediately afterward. By taking into account the larger scope of Hilbert's research interests, it is possible to understand his *Grundlagen der Geometrie* in a new way, namely as an attempt to rebuild the paradigm of classical Euclidean geometry.

Cousin, Marion : ***Tokyo Mathematics Society 東京数学会社 (Tôkyô sûgaku kaisha) in Meiji mathematical revolution. A study of its influence on the selection of logic vocabulary.***

After more than 200 years' isolation and Commodore Perry's intervention to force Japan to open its borders, the Japanese authorities decided a massive introduction of western technology and sciences into the country, in order to insure rapid development and be considered as an equal by other nations. As a consequence, in every school in the country, traditional practices were replaced with western theories in the teaching of mathematics.
In this presentation, I shall deal with the Tokyo mathematics society, a group which, although non official, had a major part in introducing mathematical matters. I shall try to determine the influence it had on the content of the textbooks that were used in teaching, especially concerning the vocabulary issue.

Cretney, Rosanna : ***Euler as correspondent***

Over the course of his life, Leonhard Euler (1707--1783) wrote around 1000 letters, and received 2000 more. His correspondence network stretched across the whole of Europe and included almost 300 people, including most of the preeminent mathematicians of the eighteenth century. Most of Euler's letters have now been published as part of his collected works. It has thus become possible to study the body of Euler's correspondence as a whole, and to examine how his mathematical output was shaped by his activities as a correspondent. In my talk, I will outline how I intend to proceed with this investigation.

Daudon Vincent : ***Method of First and Ultimate Ratios, a personnal or collective undertaking ?***

The mathematical method used by Newton in the Mathematical Principles of Natural Philosophy is not at all like the those used by his contemporaries. He develops the method of First and Last Ratios in order to express the centripetal force mathematically, which is the chief aim of the Principia, although he had for about fifteen years already possessed the method of fluxions and infinite series, a method that can be used to satisfy these aims.

He justifies this new method in a scholium. It has the advantage of « to avoid the tedium of working out lengthy proofs by reductio ad absurdum in the manner of the ancient geometers », and of not to having « rather harsh hypothesis » all the while being geometrical and obtaining « the same result as by the method of indivisibles ». However, the propositions demonstrated by Newton in the Principia rest upon the results of works already established, in essence, by from Kepler, Galileo and Huygens.

Through a detailed study of propositions from the Principia, a survey of the diverse mathematical methods discussed by Newton in the scholium, and the results of the science of motion taken up by ahis predecessors, we will discuss how the development and the use of the method of the First and Last Ratios can be viewed as a collective mathematicaly practice that culmined in the founding of the classical mechanics.

Dupond, Marie : ***Issues of the "collective" in the idea of progress of mathematicians in the second part of the 18th century: an historical perspective of scientific identity through the history of the mathematical practice of application***

In the end of the 18th century in France, the *Collective* has at least three dimensions in scientific practice: with colleagues, with students and with other human beeings. Those three dimensions are linked to three spaces: scientifical, pedagogical and social where mathematicians such as Condorcet (1743-1794) and Monge (1746-1818) actualised, diffused and applied the idea of progress by creating and multiplying connections between those three spaces. I would like to submit the results of my historical study of the idea of progress and of the procedure of application. The frame of my research is the study and the edition of the Gaspard Monge's correspondence in the second part of the French Revolution from 1795 to 1799. In historical and biographical works, this period is often called and described as the political turn in Monge's action and career. The aim of my study is to find the coherency in the diversity of Monge's actions and productions determinating correlations between scientific identity and social action.

An historical study of the idea of progress shows that twenty years before the French Revolution the idea of progress defined a scientific identity based on three modalities of action: acquisition, transmission and application of knowledge. These were expressed and realized by mathematicians in a collective way of practice through a collective aim and purpose. The question of the *Collective* can be discussed following the idea of progress for mathematicians of the 18th century at specific points: the emergence of the scientific community, the engagement of mathematicians in institutional and pedagogical projects, their political action, but firstly and fundamentaly their scientific research and their mathematical practice.

The application and transmission of knowledge are two major axis and tools to examinate the *Collective* in the new scientific practice and identity defended by the mathematicians in the second part of the 18th century. But one of both, the application, is at the same time tool and fundment. At this point, the investigation of the program drawn by the 17th century is necessary to understand the fundamental and practical fonction of the procedure of application and the reception of cartesian mathematics by 18th century mathematics.

Durand, Antonin :

Eckes, Christophe : ***Weyl's monography on quantum mechanics (1928-1931) : its situation in the mathematization of quantum mechanics as a collective process (1925-1931)***

In our presentation, we will desbribe the genesis of Weyl's monography on quantum mechanics (first edition 1928, second edition 1931). To this end, we would like to show that, between 1925 and 1931, Weyl discussed with most of the scientists working on the foundation and the mathematization of quantum mechanics : Born, Jordan, Heisenberg, von Neumann, Schrödinger, Pauli, Dirac, Heitler, London and Wigner.

Gruppentheorie und Quantenmechanik can be seen as a wide synthesis in mathematics as well as in mathematical physics. In this monography, Weyl sums up for the first time the innovations in functional analysis due to von Neumann (1927). Correlatively, he develops in detail his own contribution in the representation theory of finite groups and Lie groups (1924-1931). According to him, this mathematical theory must play a central role in the formalization of quantum mechanics. Weyl also describes the latest refinements of quantum theory : the hypothesis of the spinning electron expressed in the language of representation theory and Dirac?s relativistic quantum mechanics.

Weyl's synthesis must be studied in the light of the different projects of mathematization of quantum mechanics within this period : between 1925 and 1931 he is engaged in a correspondence with Born, Jordan, von Neumann, Pauli, Heisenberg, etc. In other words,

Weyl's monography can be seen as a result of a collective process. Conversely, we would like to know whether the use of group-theoretical methods in quantum mechanics can also be viewed as a collective project.

Elliee, Fariba :

In 1924, the problem of looking for invariants of a second order differential equation has been addressed and solved by Elié Cartan, who posed the first problem of the existence of space for normal connections. Invariants studied by Elié Cartan is related to a most general point transformation, a projective space attached to the differential equation. These concepts have been generalized in 1937 by Mohsen Hachtroudi for differential holonomic and non-holonomic systems. In his book: „Les connexions normales affines et weyliennes“, the essential problem was considered by Mohsen Hachtroudi, is the invariant of differential systems of the hypervolume space. The search for invariants of a second differential equation with respect to an infinite group leads to weylian connection. I would shortly introduce some of concepts and conclusions of this work on differntial geometry.

Ikonicoff, Roman : ***A notion of Effectivity in E. Borel (1900-1905) based on intersubjectivity***

The title "Collective in mathematical practices" can be interpreted in two ways: either by reference to the collective aspect of practices, which involves exchanges and collaborations, or by reference to the practices of a single mathematician, who can bring up the notion of "collective" as an element guaranteeing the true mathematical nature of his practices, specially if they have not been (yet) formalized. It is this second interpretation I would like to illustrate, by stressing the importance of the abstract notion of "collective practice" in the emergence of new concepts. For this I rely on a specific case: the search by Emile Borel, between 1898 and 1908, of a definition of *effective procedure* - a notion that will be made equivalent to general recursion, --definability and T-computability by Church, Kleene and Turing in the years 1936-1937. The idea is also to compare Borel’s notion of "collective" with Turing’s notion of "human calculator" (the basis of its abstract machine), wondering if the second could be seen as an objectified representation of the first (the human calculator as the "lowest common multiple" of all the practices of mathematicians).

In historical terms, in the late 19th century, the question of the effectivity of certain practices has become central for some mathematicians following the outbreak of the paradoxes in Cantor’s naive set theory (Cantor’s and Burali-Forti’s paradoxes). By calling *effective* a demonstration or a mathematical object (given in intuition), a mathematician like Borel meant he "guaranteed" that his proof (valid in the logical sense) or his object couldn’t lead to paradoxes. But at that epoch effectivity appeared as a judgment unconstrained by objective principles. So Borel, to avoid the trap of "subjectivism", has come to lean back that notion on the concept of collective practice. For example, if in 1898[1], he considers that a demonstration’s procedure is effective if it is "completely expressible *by a finite number of words, among which may include the word* indefinitely [...]," he states in 1900[2] that this principle is constrained by the idea of an unambiguous communication between mathematicians. He wrote : "*the notion of the indefinite, or* [actual] *countable infinite, is, for mathematicians, a notion entirely clear,* ***when they speak among them****, leading no ambiguity; there is no need to discuss the truth of this notion, as a notion; it is true simply because it exists* [...]. [On the contrary] *those whose mathematical education is advanced enough that they understand this theorem* [[3]]*, as clearly as everyone understands that after each integer there is another one, do not share a common concept of transfinite, as clear as the notion they have of the indefinite, that is to say, such that they can understand each other when they talk about it, with no chance of error*". Doing that, Borel eliminates the risk of subjectivism in effective practice by certifying its objectivity in reference to an idealized "collective practice", a kind of intersubjective field - which we compare to the Cavailles’s concept of "thematic field"[4] (replacing the "transcendental subject" in Husserl's phenomenology). This objectification process, by a call to *collective*, is the first step toward his great achievement (in 1908[5]): the mathematical expression of the notion of effectivity *via* the concept of *effectively enumerable set*.

Kaufholz, Eva : ***A new perspective on mathematical schools***

In the last decades, mathematical schools as sociological structures have come to the attention of historians. But still, no consensus on a reasonable definition of a school has been reached. Hence, most studies on this subject start off by giving an idiosyncratic definition, usually based on a catalogue of criteria for the emergence, development and continued existence of mathematical schools. Even though intended to be universally valid, these criteria are usually influenced by the specific school under examination and therefore more often than not inapplicable in other contexts. This stems from the fact that mathematical schools are heavily dependent on the time and place of their development.

Due to the high diversity of mathematical schools in different countries and centuries, a reasonable definition should thus keep the balance between being as exact as possible and as vague as needed to include all possible manifestations. I therefore propose a new approach based on Ludwik Fleck’s term “Denkstil” (“thought-style”) as the least common denominator of all mathematical schools. The utility of this concept will be highlighted through the example of the Weierstrassian school of mathematics, that prospered in Berlin during the second half of the 19th century.

Kranz, Philipp : ***Mathematicians in Germany after World War II: The early history of Oberwolfach***

The Mathematisches Forschungsinstitut Oberwolfach (MFO) was founded as “Reichsinstitut für Mathematik” in 1944 by the mathematician Wilhelm Süss. Süss, member of the Nazi Party since 1937, was at that time a leading figure in German mathematics as president of the German Mathematical Society and rector of the University of Freiburg. During the last months of World War II the research institute became a refuge for many mathematicians and was saved from the plundering of French troops by the English mathematician John Todd. After 1945, the institute housed a few permanent members and many German and international guests. The first meetings, in which international mathematicians participated, took place in the late 1940s. Since then, the MFO developed into one of the world's leading centres for workshops in all fields of mathematics, including the history of mathematics.

1 **Borel**, *Leçons sur la théorie des fonctions*, Gauthier-Villars, 1898, *Note II*, p.122.

2 **Borel**, *L'antinomie du transfini*, Revue philosophique, 1900, t.49, p.378-383. In *Œuvres complètes* (p.2121-2127), p.2124

3 Borel talks about the theorem of Du Bois-Reymond on functions’s growth: given any countable sequence of increasing functions, there is an increasing function larger than each of them. Borel wonders about the possibility that this theorem constitute a principle of transfinite induction.

4 **Cavaillès**, *Méthode axiomatique et Formalisme*, Paris, Hermann, reed. 1981 (see p.176-178).

5 **Borel**, *Les “paradoxes” de la théorie des ensembles*, 1908, in *Œuvres complètes*, p.1271-1276.

Since the early days of the institute, visiting mathematicians were asked to write an abstract of their papers in an abstract book. Furthermore, guest books listed visitors and participants of meetings and sometimes include personal dedications like poems or drawings. These sources provide valuable information about the mathematicians and their research in Oberwolfach. In 2008 the abstract and guest books were digitized and now made available online in the Oberwolfach Digital Archive (ODA). The paper will report on the early history of the MFO and present the ODA.

Lê François : ***On the 27 lines upon the cubic surface***

The "27 lines theorem" states that every smooth cubic surface contains exactly 27 lines. This theorem, which appeared in the middle of the 19th century, seems to have been of the greatest interest for numerous mathematicians (Cayley, Salmon, Schläfli, Steiner...). The aim of the talk is to see on this theorem how these mathematicians worked together to answer some related questions, in particular those of the demonstrations of the theorem and of the notation of the 27 lines.

Lorenat, Jemma : ***Synthesists and Analysts in Nineteenth Century Geometry***

By 1800, in geometry one could distinguish two methods of research – the synthetic and the analytic. The former is intuitive, convincing, and graphical, in contrast, the latter is general, effortless, and fruitful. Furthermore, there was a complex rivalry between the so-called Synthesists and Analysts. The Synthesists accused their adversaries of mere mechanical operations, while in rebuttal the Analysts claimed that they had opened the field of geometry to research beyond the scope of synthetic means. This paper will compare the problems and practices within these methods and consider how the field of geometry transformed into multiple disparate sub-disciplines. In doing so, I will consider how research groups define themselves and how these differentiations shape their interests and interactions.

Monteiro de Siqueira, Rogério :

Morel, Thomas : ***Collective practices in the mathematical journals of Carl Friedrich Hindenburg (1781-1800)***

The four journals successively launched by Carl Friedrich Hindenburg (1741-1808) between 1781 and 1800 are one, if not the oldest, example of a journal exclusively dedicated to the study of mathematics. During these nineteen years, more than 150 mathematical papers were published, covering almost all the fields of the current mathematics.

Preveraud, Thomas :

Ramirez, Alfredo : ***An early collective history of Symplectic Geometry***

In the 1960's the study of 2-differential forms, non-degenerated and bilinear over a differential manifold, attracted the interest of many mathematicians and physicists, including Jean-Marie Souriau, Ralph H. Abraham, Jerrold E. Marsden and Vladimir Igorevich Arnold.

In 1943, Carl Ludwig Siegel published an article with the title "Symplectic Geometry" [c.f.(Siegel 1943)]. There, he generalized the theory of automorphic functions to the case of m complex variables, investigated the invariant geometric properties of a simple domain E, identified the discontinuous subgroups operating on E and constructed their fundamental domains.

An application of this theory can be found in celestial mechanics, a field that Siegel used to teach since he had been appointed as a pro- fessor in Frankfurt am Main in 1922 (Siegel 1956). Some publications on this field are (Siegel 1941) and (Siegel 1956). The latter one are his lecture notes on celestial mechanics, a course he gave in Göttingen during the winter-semester 1951-1952. Jürgen K. Moser was the one who compiled the notes for the book four years later [c.f. (Siegel 1956), p.i].

Three years before the publication of Siegel's lectures notes, Jean- Marie Souriau gave a conference in Strasbourg at the Colloques In- ternationaux du Centre National de la Recherche Scientifique with the title "Géométrie symplectique différentielle" (Souriau 1953). Af- ter these two events – the publication of Souriau's presentation and Siegel's lecture– symplectic geometry was fully linked to the study of classical mechanics and the calculus of variations. Fields which have been of interest to many Mathematicians since a long time.

Nowadays, the field of symplectic geometry changed from the study of automorphic functions to the study of symplectic manifolds.

Lets try to find out the collective work in the early history of symplectic geometry.

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Reimann Katrin :

Turner, Laura : ***Mittag-Leffler and the Scandinavian Congress of Mathematicians***

The prominent Swedish mathematician Gösta Mittag-Leffler called for colleagues from Sweden, Denmark, Norway, and Finland to meet for a congress of mathematicians in Stockholm in 1909, the first in a series of biannual meetings which became an institution for Scandinavian mathematics. Mittag-Leffler sought to organize a cooperative, regional effort for the furthering of mathematical education and, in particular, mathematical research. Moreover, he believed that the perceived distance of mathematics from everyday life would assist in establishing a new « Scandinavianism » to unite the four countries, which throughout history had shared a common language and culture. In this paper I explore Mittag-Leffler's motivations for establishing the Scandinavian Congress of Mathematicians, the nature of the collectivity he sought to create, and discuss the extent to which this overall goal was received and shared by others in the group.

Viertel, Klaus ***: The History of uniform convergence or "was there a fourth man..." ?***

If Cauchy did not introduce uniform convergence, who else did achieve this and where did it happen? As new research has shown this situation has become even more complicated. Literature has given us several different suggestions: First of all there are G. G. Stokes (1847) and nearly contemporaneous the german mathematician Philipp Ludwig Seidel (1848). Then you have Carl Weierstraß, student in Münster and his work from 1841, which has been inspired by Prof. Gudermann and a paper written 1838 but published in 1894. Finally in 1986 Grattan-Guinnes has established the hypothesis of a "fourth man". Does a "fifth man" or maybe a "sixth woman" exist?

Zheng, Fanglei :