RomFin2019 and FSDONA2019

May 28, 2019

Invited talks in RomFin2019

Nonlinear oblique projections in Lie groups
Daniel Beltita (Romanian Academy)
Monday 11:15 Agora XXII
The familiar notion of oblique projection from linear algebra is extended to the nonlinear framework of Lie groups. The nonlinear oblique projections turn out to be rational mappings on Schubert cells of suitable Grassmann manifolds. We also explore the impact of these constructions on the study of the C*-algebras of solvable Lie groups. This talk is based on joint work with Ingrid Beltita.

Dealing with not allowed starting points for solutions to singular SDEs in Hilbert spaces: a potential theoretical approach
Iulian Cimpean (Romanian Academy)
Tuesday 10:00 Agora XXII
In studying SDEs with singular coefficients on an in finite dimensional state space (e.g. SPDEs of evolutionary type), a typical issue is that one can not find a solution for every starting point. The same can happen when constructing solutions of martingale problems or Markov processes from (generalized) Dirichlet forms. The aim of this talk is to present a general method to construct extended solutions for all starting points in such a way that e.g. in the case of an SDE, they are solutions at least after any strictly positive time, or in case of a given strong Feller resolvent, the so constructed Markov process is defined for every starting point. This is joint work with L. Beznea and M. Roeckner.

ℓ_1-bases in Banach algebras and Arens irregularities in harmonic analysis
Mahmoud Filali (University of Oulu)
Monday 16:30 Agora XXII
Arens irregularity of a Banach algebra $\mathcal{A}$ is due to elements in its Banach dual $\mathcal{A}^*$ which are not weakly almost periodic. Unlike C^*-algebras, the usual algebras in harmonic analysis (such as the group algebra or the Fourier algebra, when known) turned out to be all Arens irregular (even in an extreme way as we shall see in the talk). At the very beginning, about seventy years ago, Richard Arens himself proved that ℓ^1 is irregular, and was followed by Mahlon Day proving the same result for many discrete groups including the abelian ones. A long exciting story followed. The talk is an attempt to tell you this story and to explain the combinato- rial reason (on the group or its dual) making such irregularity. If time permits, we will see some recent developments on the subject.

Local triviality of analytic mappings
Cezar Joiţa (Romanian Academy)
Monday 10:00 Agora XXII
Suppose that $f : \mathbb{K}^n \to \mathbb{K}^p$ is an analytic mapping where $\mathbb{K} = \mathbb{C}$ or $\mathbb{R}$ and $n > p > 0$. We will discuss whether it is possible to impose topological conditions on the fibers of f which will insure that f is a locally trivial fibration. Based on joint works with Mihai Tibăr.

On the norm of the Hilbert matrix operator on weighted Bergman spaces
Mikael Lindström (Åbo akademi, Finland)
Tuesday 16:30 Agora XXII
The Hilbert matrix is a classical (one-sided) infinite matrix introduced by Hilbert in 1900's. Historically, its properties have been studied in the sequence spaces l^p by Hardy and Riesz. It can also be defined on spaces of analytic functions by its action on their Taylor coefficients and it is one of the central linear operators investigated in operator theory. In recent years, there has been active research on determination of the exact value of its operator norm on different analytic function spaces. We will discuss these results on Hardy and Bergman spaces and our contribution regarding the exact value of the norm of the Hilbert matrix operator on weighted Bergman spaces. The talk is partly based on a joint work with Santeri Miihkinen and Niklas Wikman (Åbo Akademi University).

Truncated Toeplitz operators and beyond
Dan Timotin (Romanian Academy)
Tuesday 11:15 Agora XXII
Truncated Toeplitz operators are compression of multiplication operators to subspaces of H^2 which are invariant for the backward shift. They represent an area of research in operator theory that has seen much progress in the last decade. After a short presentation of these operators, we will discuss some recent developments, mostly concerning extensions of truncated Toeplitz operators in different directions.

Invited talks in the joint session

On pointwise estimates
Ritva Hurri-Syrjänen (University of Helsinki, Finland)
Wednesday 10:00 Agora XXII
I will discuss the validity of some pointwise estimates for functions defined in irregular domains in the Euclidean n-space. As an application we will show that there exist embeddings into suitable Orlicz spaces from the L^1_p-space such that the corresponding Orlicz norm depends on the geometry of the given domain. The results are sharp for L^1_1-functions.

My talk is based on joint work with Petteri Harjulehto.

The Monotonicity of the Principal Eigenvalue of the p-Laplace Operator
Mihai Mihailescu (University of Craiova)
Wednesday 10:45 Agora XXII
In this talk we deal with the monotonicity with respect to $p \in (1, \infty)$ of the principal eigenvalue of the p-Laplace operator on a bounded, open, convex domain $\Omega \subset \mathbb{R}^D$ ($D \geqslant 1$) with smooth boundary subject to the homogeneous Dirichlet and Neumann boundary conditions. An application of the monotonicity result is presented in relation with the study of the positivity of a minimization problem involving an inhomogeneous Rayleigh quotient. The results presented in this talk are obtained in collaboration with Marian Bocea and Julio D. Rossi.

On the optimal Besov regularity of solutions to stochastic differential equations
Mark Veraar (Delft University of Technology, The Netherlands)
Wednesday 12:15 Agora XXII
In this talk I will explain a recent result obtained jointly with Martin Ondrejat. It states that the paths of stochastic integrals and solutions to parabolic stochastic differential equations

have the same regularity in time as Brownian motion. To obtain the strongest results possible the temporal regularity is considered in a Besov-Orlicz space.

Invited talks in FSDONA2019

Higher regularity results for non-uniformly elliptic equations
Sun-Sig Byun (Seoul National University, South Korea)
Saturday 13:00 Agora XXII
A divergence structure quasilinear elliptic equation with non-standard growth condition is discussed. The nonlinearity involves a non-uniformly ellipticity property and the boundary of the domain is irregular. We prove an optimal regularity theory for solutions to such a highly nonlinear problem in the frame of a generalized Sobolev space.

Density of smooth functions in Musielak–Orlicz spaces
Iwona Chlebicka (University of Warsaw, Poland)
Friday 11:15 Agora XXII
Musielak–Orlicz spaces are equipped with a norm defined by the means of the functional $\xi \mapsto \int_Z M(z,\xi)\,dz$, where $\xi \mapsto M(\cdot,\xi)$ is convex, typically with $Z = \Omega$ or $Z = \Omega \times [0,T]$. They provide unified description of variable exponent, Orlicz, weighted Sobolev, and double-phase spaces inheriting technical difficulties resulting from general growth and inhomogeneity. See survey [Chlebicka, A pocket guide... Nonl. Anal. 2018].

One of the features of Orlicz–Sobolev spaces with non-doubling growth is that smooth functions are not dense in norm topology, but in a weaker one – the so-called modular topology. On the other hand, in inhomogeneous spaces like variable exponent or double-phase ones, we have to require regularity of the function defining norm, to get the density. Altogether, some structural conditions are needed to ensure approximation by smooth functions, that is to ensure absence of Lavrentiev's phenomenon.

In the general case of Musielak–Orlicz spaces we formulate conditions on the balance of asymptotic behaviour of a modular function for small perturbations of z and big values of ξ. We provide the density of smooth functions in the modular topology in Musielak–Orlicz–Sobolev spaces unifying the known results in Orlicz-Sobolev spaces, as well as variable exponent Sobolev spaces for log-Hölder-continuous exponents. We confirm the precision of the method by showing the lack of Lavrentiev's phenomenon in the double-phase case within the range $q/p \leqslant 1 + \alpha/N$ sharp due to [Colombo & Mingione, ARMA 2015].

I will stress the meaning of these density results in the context of applications to partial differential equations; in particular, to the theory of existence to elliptic and parabolic problems with strongly nonstandard growth and merely integrable data.

Based on joint works: Ahmida, Chlebicka, Gwiazda, Youssfi, JFA 2018 and series of results on existence with Gwiazda and Zatorska–Goldstein 2018–2019.

Global gradient estimates in double obstacle problems with measure data
Yumi Cho (Seoul National University, South Korea)
Thursday 11:15 Agora XXII
In this talk, we consider double obstacle problems with measure data involving $p(x)$-Laplace type. We study the concept for a limit of approx- imation solutions and give global Calderón–Zygmund type estimates for the gradient under optimal regularity assumptions on the variable exponent, the nonlinearity, and the boundary of a domain. This is a joint work with Sun-Sig Byun and Jung-Tae Park (KIAS).

Latest news on double phase problems
Cristiana De Filippis (University of Oxford, United Kingdom)
Saturday 12:15 Agora XXII
The Double Phase energy

$$W^{1,p}(\Omega) \ni w \mapsto \mathcal{P}(w,\Omega) := \int_\Omega H(x,Dw)\,dx,$$
$$H(x,z) := |z|^p + a(x)|z|^q, \quad 0 \leqslant a(\cdot) \in C^{0,\alpha}(\Omega), \;\; 1 < p \leqslant q,$$

falls into the realm of non-uniformly elliptic problems in the sense that the structure of the integrand allows the ellipticity ratio

$$\mathcal{R}(z,B) := \frac{\sup_{x\in B} \text{ of the highest eigenvalue of } \partial_z^2 H(x,z)}{\inf_{x\in B} \text{ of the lowest eigenvalue of } \partial_z^2 H(x,z)} \approx 1 + \|a\|_{L^\infty(B)}|z|^{q-p}$$

to become unbounded for $p < q$ as $|z| \to \infty$. This type of functional has been introduced by Zhikov in the setting of homogeneization and it models the behavior of strongly anisotropic materials whose hardening properties drastically change with the point. We consider minimizers of variational integrals of double phase type and discuss some of their regularity features in various frameworks.

This talk is based on the content of the following papers:

- I. Chlebicka, C. De Filippis, Removable sets in non-uniformly elliptic problems. *Submitted*.
- C. De Filippis, Regularity for solutions of fully nonlinear elliptic equations with non-homogeneous degeneracy. *In preparation*.
- C. De Filippis, G. Mingione, A borderline case of Calderón-Zygmund estimates for non-uniformly elliptic problems, *St. Petersburg Mathematical Journal*, to appear.
- C. De Filippis, G. Mingione, Manifold constrained non-uniformly elliptic problems. *J. Geometric Analysis*, to appear.
- C. De Filippis, G. Palatucci, Hölder regularity for nonlocal double phase equations, *Journal of Differential Equations*, 267, 1, 547-586, (2019).
- C. De Filippis, J. Oh, Regularity for multi-phase variational problems. *Journal of Differential Equations*, 267, 3, 1631-1670, (2019).

On the minimization and stability of the Riesz potential
Aldo Pratelli (University of Pisa, Italy)
Thursday 10:00 Agora XXII
The Riesz potential has been intensively studied in the last decades, mainly for its role in physics, since it can be used to estimate the repulsive force between particles. From the mathematical point of view, it is well known (as it directly comes from the Riesz inequality) that it is maximized by balls, and a quantitative version of this inequality has been proved by Burchard and Chambers few years ago. Adding the Riesz potential of a set and its perimeter gives a formula for the energy of a set of particles: the repulsive force would tend to disperse atoms, while the perimeter tends to put them together. By works of Küpfer-Muratov and other authors it is known that this energy is minimized by balls for sufficiently small total mass, while this becomes false for greater total mass. In this talk, we will give an overall view of this problem, and we will describe some classical and some very recent results. Joint work with N. Fusco.

Bounded variation spaces with variable exponent
Humberto Rafeiro (University of UAE, United Arab Emirates)
Friday 17:30 Agora XXII
We will discuss the notion of bounded variation spaces with variable exponent (in the Wiener and in the Riesz sense). In particular, we will show some embedding results, a Riesz representation lemma, and a characterization of global Lipschitz Nemytskii operators in the Riesz bounded variation spaces with variable exponent. If time permits, we will touch on the characterization of the linear functionals on variable exponent Bochner-Lebesgue spaces in terms of the variable exponent Riesz bounded variation spaces for vector measures.

Besov regularity of parabolic PDEs
Cornelia Schneider (University of Erlangen-Nürnberg, German)
Saturday 10:45 Agora XXII

The p-Laplace system with right-hand side in divergence form: Inner and up to the boundary Campanato estimates
Sebastian Schwarzacher (Charles University, Czech Republic)
Thursday 17:30 Agora XXII
In this talk we collect some very recent estimates for the gradient of solutions, to the p-Laplace system with right-hand side in divergence form. Both estimates inside the domain for local solutions, and global estimates for solutions to boundary value problems are discussed. Their formulation involves sharp maximal operators, whose properties enable us to translate some aspects of the elliptic regularity theory into a merely harmonic analytic framework. As a consequence, a flexible, comprehensive approach to estimates for solutions to the p-Laplace system for a broad class of norms is derived. In particular, global estimates under minimal boundary regularity are presented.

This is a joint work with: D. Breit, A. Cianchi, L. Diening and T. Kuusi.

Sharp estimates for Fourier multipliers
Lenka Slavíková (University of Missouri, USA)
Saturday 10:00 Agora XXII
A Fourier multiplier operator is given by composition of three operators: the Fourier transform, multiplication by a bounded function, and the inverse Fourier transform. The problem of finding sharp sufficient conditions for functions to define Fourier multiplier operators bounded on different function spaces is of central importance in harmonic analysis. Obtaining such conditions is the best one can expect as there is no good characterization of boundedness of multipliers, even on spaces as simple as L^p.

In this talk, I will present a sharp version of the classical multiplier theorem of Hörmander, formulated in terms of fractional Lorentz-Sobolev spaces. I will also discuss a sharp criterion for $L^2 \times L^2 \to L^1$ boundedness of bilinear operators associated with multipliers with L^∞ derivatives, given in terms of the L^q integrability of the multiplier. This is a joint work with Loukas Grafakos and Danqing He.

Multiplication Between Hardy Spaces and Their Dual Spaces
Dachun Yang (Beijing Normal University, China)
Friday 10:00 Agora XXII
It is well known that bilinear decompositions of products of Hardy spaces and their dual spaces play an important role in the study on various problems from analysis. In this talk, we

present some recent progresses on such bilinear decompositions of products of Hardy spaces and their dual spaces. Some open questions are also mentioned in this talk.

Contributed talks in RomFin2019

Connections between the Dirichlet and the Neumann problem for integrable boundary data
Lucian Beznea (Simion Stoilow Institute of Mathematics of the Romanian Academy and University of Bucharest)
Monday 14:00 Quantum M2
We provide an explicit solution of the generalized solution of the Neumann problem for the Laplace operator, based on a representation of the solution on the unit ball in $\mathbb{R}^n$, $n \geqslant 1$, in terms of the solution of an associated Dirichlet problem, in the case of integrable boundary data. We also provide a new approach to Brosamler's formula which gives a probabilistic representation of the solution of the Neumann problem for the Laplacian in terms of the reflecting Brownian motion. The talk is based on joint works with Mihai N. Pascu (Braşov, Romania) and Nicoale R. Pascu (Kennesaw State University, USA).

On new means generated by generalized trigonometric functions with two parameters
Barkat Bhayo (Sukkur IBA University, Pakistan)
Monday 14:30 Quantum M2
In 1995, P. Lindqvist (4) studied generalized trigonometric functions depending on a parameter $p > 1$ which for the case $p = 2$ reduce to the familiar functions. These functions were utilized to establish a new form of complete p-elliptic integrals of the first and the second kind by Takeuchi (6). As an application of generalized trigonometric and hyperbolic functions with two parameters (1), (2), (4),(6), here author generalizes logarithmic mean L, Neuman-Sándor M, two Seiffert means P and T, see (5). Moreover, several two-sided inequalities involving these generalized means are established.

(1) Á. Baricz, B. A. Bhayo, T. K. Pogány *Functional inequalities for generalized inverse trigonometric and hyperbolic functions*, J. Math. Anal. Appl. 417 (2014), 244–259.
(2) B. A. Bhayo and M. Vuorinen. *Inequalities of eigenfunctions of $p-$laplacian*, Issues of Analysis. Vol. 2(20), 1(2013), 14–37.
(3) B. A. Bhayo and J. sándor *On certain new means generated by p-functions*, https://arxiv.org/abs/1805.06762.
(4) P. Lindqvist *Some remarkable sine and cosine functions*, Ricerche di Matematica Vol. XLIV (1995) 269–290.
(5) E. Neuman and J. sándor *On the Schwab-Borchardt mean*, Math. Pannon., 14, 2 (2003), 253–266.
(6) S.Takeuchi, *Generalized Jacobian elliptic functions and their application to bifurcation problems associated with p-Laplacian*, J. Math.Anal. Appl. 385 (2012), no. 1, 24–35.

On symmetric and smooth properties of the $p-$ integrable Teichmüller spaces
Melkana Brakalova-Trevithick (Fordham University, USA)
Monday 15:30 Quantum M2
We study symmetric and smooth properties of the p-integrable subspaces T_p of the universal Teichmüller space T , for $p > 0$. The elements of T_p are quasisymmetric automorphisms of the real line , which have a q.c. extension with $p-$ integrable complex dilatation with respect to the Poincaré metric. Our approach is based on applying properties of quasiconformal maps and their boundary behavior.

Exceptional sets for the definition of quasiregularity
Mihai Cristea (University of Bucharest, Romania)
Monday 15:00 Quantum M2
We establish some quasiregularity conditions in terms of the local boundedness of the inferior linear dilatation outside some exceptional sets E.

Reflection principle for the complex Monge-Ampére equation and plurisubharmonic functions
Mika Koskenoja (University of Helsinki, Finland)
Tuesday 14:00 Quantum M2
We study reflection principle for several central objects in pluripotential theory. First we show that the odd reflected function gives an extension for pluriharmonic functions over a flat boundary. Then we show that the even reflected function gives an extension for nonnegative plurisubharmonic functions. In particular cases odd and/or even reflected functions give extensions for classical solutions of the homogeneous complex Monge-Ampère equation. Finally, we state reflection principle for the generalized complex Monge-Ampère equation and maximal plurisubharmonic functions.

Nonlocal m-Dissipative Evolution Inclusions in General Banach Spaces
Alina Lazu (Gh. Asachi Technical University of Iasi, Romania)
Tuesday 14:30 Quantum M2
We deal with multivalued perturbations of m-dissipative evolution inclusions with nonlocal initial conditions in arbitrary Banach spaces. We prove the existence of solutions when the multivalued right hand side is Lipschitz and has nonempty closed bounded values. Moreover, we show that the closure of the solution set of the nonlocal differential inclusion is dense in the solution set of the corresponding relaxed differential inclusion.

Stochastic differential equations of fragmentation and applications
Oana Lupascu-Stamate ("Institute of Gheorghe Mihoc-Caius Iacob" Institute of Mathematical Statistics and Applied Mathematics of Romanian Academy)
Tuesday 15:00 Quantum M2
We consider a stochastic fragmentation process of an infinite particle system. We introduce a stochastic differential equation of fragmentation with either a continuous or a discontinuous fragmentation kernel and we give several examples. The results are obtained by combining analytic and probabilistic tools, as the associated martingale problem. As an application, we consider a stochastic model for the fragmentation phase of an avalanche, involving a physical fractal property. Finally, we complete the theoretical approach with a numerical simulation. These results were obtained jointly with Lucian Beznea (Bucharest) and Madalina Deaconu (Nancy).

Encodings for the calculation of the permutation entropy and their applications on full-scale compartment fire data
Flavia-Corina Mitroi-Symeonidis (Police Academy "Alexandru Ioan Cuza", Romania)
Tuesday 15:30 Quantum M2
Based on the data collected during a full-scale experiment, the order/disorder characteristics of the compartment fire are researched. We discuss methods, algorithms and the novelty of our entropic approach. From our analysis, we claim that the permutation type entropies can be successfully used to detect unusual data and to perform relevant analysis of fire experiments.

Weighted Bergman type spaces for the iterated parabolic operators of fractional order
Masaharu Nishio (Osaka City University, Japan)
Monday 15:00 Quantum M3
We consider parabolic operators of fractional order

$$L^{(\alpha)} := \partial_t + (-\Delta)^\alpha$$

for $0 < \alpha \leqslant 1$. In this talk, after explaining general theory, we shall discuss the Bergman type spaces on the upper half space in the Euclidean space.

Network Controllability: Algorithmics for precision cancer medicine
Ion Petre (University of Turku, Finland)
Tuesday 15:00 Quantum M3
The intrinsic robustness of living systems against perturbations is a key factor that explains why many single-target drugs have been found to provide poor efficacy or to lead to significant side effects. Rather than trying to design selective ligands that target individual receptors only, network polypharmacology aims to modify multiple cellular targets to tackle the compensatory mechanisms and robustness of disease-associated cellular systems, as well as to control unwanted off-target side effects that often limit the clinical utility of many conventional drug treatments. However, the exponentially increasing number of potential drug target combinations makes the pure experimental approach quickly unfeasible, and translates into a need for algorithmic design principles to determine the most promising target combinations to effectively control complex disease systems, without causing drastic toxicity or other side-effects. Building on the increased availability of disease-specific essential genes, we concentrate on the target structural controllability problem, where the aim is to select a minimal set of driver/driven nodes which can control a given target within a network. That is, for every initial configuration of the system and any desired final configuration of the target nodes, there exists a finite sequence of input functions for the driver nodes such that the target nodes can be driven to the desired final configuration. We investigated this approach in some pilot studies linking FDA-approved drugs with cancer cell-line-specific essential genes, with some very promising results.

Kaehler and locally conformally Kaehler metrics on complex spaces with singularities
Ovidiu Preda (Institute of Mathematics of the Romanian Academy)
Monday 14:30 Quantum M3
We introduce a generalization of locally conformally Kähler metrics from complex manifolds to complex analytic spaces with singularities and prove that if a complex analytic space has only quotient singularities, then it admits a locally conformally Kähler metric if and only if its universal cover admits a Kähler metric such that the deck automorphisms act by homotheties of the Kähler metric. This theorem is a generalization of a well-known result from the non-singular case.

Schur parameters and the space of finite Blaschke products
Toshiyuki Sugawa (Tohoku University, Japan)
Monday 14:00 Quantum M3
We show that the set of finite Blaschke products of degree at most d, equipped with the topology of uniform convergence on compact subsets of the open unit disk, is homeomorphic to the $(2d+1)$-dimensional sphere. We provide a concrete homeomorhism by using the Schur parameters.

On the space of homogeneous modified harmonic polynomials in four dimensions
Eleutherius Symeonidis (Katholische Universitaet Eichstaett-Ingolstadt, Germany)
Tuesday 14:00 Quantum M3
The solutions $u : \Omega \to \mathbb{R}$ (Ω a domain in $\mathbb{R}^4$) of the equation

$$x_4 \cdot (\frac{\partial^2 u}{\partial x_1^2} + \frac{\partial^2 u}{\partial x_2^2} + \frac{\partial^2 u}{\partial x_3^2} + \frac{\partial^2 u}{\partial x_4^2}) + 2 \cdot \frac{\partial u}{\partial x_4} = 0$$

are called *modified harmonic functions*. Let $r := \sqrt{x_1^2 + x_2^2 + x_3^2 + x_4^2}$. In his article entitled "Modified Spherical Harmonics in Four Dimensions" (Adv. Appl. Clifford Algebras, 28 (2018)), Heinz Leutwiler conjectures that the set

$$\{r^{2n+4} \cdot \frac{\partial^n r^{-4}}{\partial x_1^\alpha \partial x_2^\beta \partial x_3^\gamma} \,|\, 0 \leqslant \alpha, \beta, \gamma \leqslant n \,;\, \alpha + \beta + \gamma = n\}$$

is linearly independent, thus forming a basis of the space of homogeneous modified harmonic polynomials of degree n on $\mathbb{R}^4$. In our talk we present a proof of this conjecture.

Compactness of the branch set of branched covers
Ville Tengvall (University of Helsinki, Finland)
Tuesday 14:30 Quantum M3
We study the compactness of the branch set (i.e. the set of points where a mapping is not a local homeomorphism) of branched covers (i.e. continuous, discrete and open mappings) in Euclidean spaces. Also quasiregular mappings and mappings of finite distortion are considered in the talk. The talk is based on joint works with Aapo Kauranen and Rami Luisto.

Contributed talks in FSDONA2019

Characterizations of G-integral m-homogeneous polynomials
Dahmane Achour (Université Mohamed Boudiaf de M'sila, Algeria)
Thursday 13:30 Quantum XVII
Summing multilinear operators started with the work of Pietsch in 1983, whereas summing polynomials started even later. This non linear theory has been increasing in the late years and many related works have appeared. Indeed nowadays it is being investigated by several interested researchers. Our main tool is the study of integrability that was done by Cilia and Gutiérrez in the frame of vector valued homogeneous polynomials. There are twoways of considering integral polynomials in the vector case: Grothendieck-integral polynomials and Pietsch-integral polynomials (respectively G-integral and P-integral for short). The notion of P-integrability is stronger than the notion of G-integrability. The relation of P-integral polynomials with summing polynomials was studied by Mastylo et all. In this talk we interested in G-integral polynomials, we characterize G-integral homogeneous polynomials as those that factor through an integral linear operator. As a consequence, we show that a m-homogeneous polynomial P is G-integral if, and only if, its adjoint is G-integral. We use this result to prove that if the dual of the range space is a $L^{p,\lambda}$ space then, the spaces of factorable strongly p-nuclear polynomials and the space of G-integral polynomials coincide. In particular, being G-integral or factorable strongly 2-nuclear is the same for any homogeneous polynomial with range in a Hilbert space.

(1) , Cilia, R., Gutiérrez, J.M.: Ideals of integral and r-factorable polynomials. Bol. Soc. Mat. Mexicana 14, 95–124 (2008)

(2) Dineen, S.: Complex Analysis on Infinite Dimensional Spaces. Springer, London (1999)
(3) Mastylo, M., Rueda, P., Sánchez-Pérez, E.A.: Factorization of (p, q)-summing polynomials through Lorentz spaces. J. Math. Anal. Appl. 449(1), 195–206 (2017)
(4) Pietsch, A.: Ideals of multilinear functional. In: Proceedings of the Second International Conference on Operator Algebras, Leipzig, pp. 185–199 (1983)

Classical operators on different vanishing Morrey spaces
Alexandre Almeida (University of Aveiro, Portugal)
Thursday 15:30 Quantum M3
Certain vanishing properties defining new subspaces of Morrey spaces were recently introduced to describe the closure of nice functions in Morrey norm. This talk aims to show that those properties are preserved under the action of various classical operators of harmonic analysis, such as maximal, singular, potential and Hardy operators. This is based on joint work with A. Alabalik and S. Samko.

Inequalities for eigenvalues of fourth order elliptic operators in divergence form on Riemannian manifolds
Shahroud Azami (Imam Khomeini International University, Iran)
Friday 14:00 Quantum XVII
In this talk, we study eigenvalue of linear fourth order elliptic operators in divergence form with Dirichlet boundary condition on a bounded domain in a compact Riemannian manifolds with boundary (possibly empty) and find a general inequality for them. As an application, by using this inequality, we study eigenvalues of this operator on compact domains of complete submanifolds in a Euclidean space.

Capacities in fractional Sobolev spaces with variable exponents
Azeddine Baalal (Université Hassan II de Casablanca, Marocco)
Thursday 13:30 Quantum M2
In this talk we present a capacities theory connected with the fractional Sobolev spaces with variable exponents. Two kinds of capacitiesare studied: Sobolev capacity and relative capacity. Basic properties of capacities, including monotonicity, outer capacity and several results, are studies. We prove that both capacities is a Choquet capacity and all Borel sets are capacitable.

New examples on Lavrentiev gap using fractals
Anna Kh. Balci (Bielefeld University, Germany)
Thursday 14:00 Quantum M2
We construct new examples on Lavrentiev phenomenon using fractal contact sets. Comparing to the well-known examples of Zhikov it is not important that at the saddle point the variable exponent crosses the threshold dimension. As a consequence we give the negative answer to the well-known conjecture that the dimension plays a critical role for the Lavrentiev gap to appear. As an application we present new counterexamples to the density of smooth functions in variable exponent Sobolev spaces and to the regularity of the functional with double-phase potential. The talk is based on joint work with Lars Diening and Mikhail Surnachev.

Harnack inequality for quasilinear elliptic equations in generalized Orlicz–Sobolev spaces
Allami Benyaiche (Ibn Tofail University, Morocco)
Thursday 16:30 Quantum M2
In this paper we prove, by a new method, the Harnack inequality for positive solutions of quasilinear elliptic equations in the generalized Orlicz-Sobolev space setting. Our approach is based on the usage of the Φ-functions associated to generalized Φ-functions and the Moser's iteration technique. As a consequence, we obtain the Hölder continuity of bounded solutions of such equations.

Multiple solutions for a Robin problem type within defnite weight in Sobolev spaces with variable exponents
Khalil Ben Haddouch (Sidi Mohamed Ben Abdellah university/ National school of applied sciences Fez, Marocco)
Friday 13:30 Quantum M3
In this work, we will study the existence of multiple solutions for the p(x)-biharmonic operator under Robin boundary conditions. By using variational approach and the Mountain Pass theorem, we obtain the existence of solutions of the problem (1.1)

$$(0.1)\qquad \begin{cases} \Delta\left(|\Delta u|^{p(x)-2}\Delta u\right) = \lambda V(x)|u|^{q(x)-2}u & \text{in} \quad \Omega \\ \frac{\partial}{\partial\nu}\left(|\Delta u|^{p(x)-2}\Delta u\right) = m(x)|u|^{p(x)-2}u & \text{on} \quad \partial\Omega, \\ \frac{\partial u}{\partial\nu} = 0 & \text{on} \quad \partial\Omega, \end{cases}$$

where $\Omega \subset \mathbb{R}^N$, $N \geqslant 2$ be a bounded smooth domain, λ is a positive parameter , $m \in L^\infty(\partial\Omega)$ with $\inf\limits_{x\in\partial\Omega} m(x) > 0$, $p(x) : \overline{\Omega} \to \mathbb{R}$ is a continuous function, and V is a given function in a generalized Lebesgue space $L^{s(x)}(\Omega)$ such that $V > 0$ in an open set $\Omega_0 \subset \Omega$ where $|\Omega_0| > 0$.

On multiplier sets in BV-type spaces
Daria Bugajewska (Adam Mickiewicz University, Poland)
Thursday 13:30 Quantum M3
In this talk we focus our attention on multiplier sets in spaces of functions of bounded variation of various types. We give the comprehensive answers to the problems concerning multiplier sets for the spaces BV , ΛBV , $WBVp$, and BV_φ. The talk is based on the recent joint papers with Simon Reinwand.

New Results on Elliptic Equation with Nonlocal Boundary Coefficient-operator Conditions in UMD Spaces: Noncommutative Cases
Mustapha Cheggag (National Polytechnic School of Oran, Algeria)
Friday 15:30 Quantum M3
This work is devoted to the study of operational second order differential equations of elliptic type with nonregular coefficient-operator boundary conditions in a non commutative framework. The study is performed when the second member f belongs to $L^p(0,1;X)$, with general $p \in]1,+\infty[$, X being a UMD Banach space. we give some new results by using semi-groups and interpolation theory. Existence, uniqueness and optimal regularity of the strict and semi-strict solution are proved.

Some Lipschitz operators characterized by their image
Elhadj Dahia (Ecole normale supérieure de Bousaada, Algeria)
Thursday 14:30 Quantum M3
In the theory of linear operator ideals, some classes are characterized by the nature of their

image on some neighborhoods of the origin of a Banach space. We introduce the notions of Lipschitz *p*-compact, Lipschitz-free *p*-compact and Lipschitz locally *p*-compact operators. We show that they can be seen as a natural extension of the linear *p* -compact operators. We compare all these three notions and show different properties. Finally, we exhibit examples to show that these three notions are different.

Existence of weak solutions for a $p(x)-$Kirchhoff-type equation with Navier boundary conditions
Zakaria El Allali (Mohammed first university, Morocco)
Friday 14:30 Quantum M3
In this talk, we prove the existence of solutions for $p(x)$-Kirchhoff-type problem with Navier boundary condition. Using variational approach and the Mountain Pass theorem, we establish some conditions for the existence of nontrivial weak solutions for $p(x)$-Kirchhoff equation

About Spectral Properties of Divergent Elliptic Operators
Vladimir Gol'dshtein (Ben Gurion University of the Negev, Israel)
Friday 14:00 Quantum M3
We study spectral properties of divergence form elliptic operators $-\mathrm{div}[A(z)\nabla f(z)]$ with Neumann boundary condition in a wide class of simply connected planar domains. Here the matrix function A is symmetric and its determinant equal to one. The studied class of domains includes quasidiscs and is described in terms of integrability properties of Jacobians of quasiconformal homeomorphisms. The composition operators theory for Lebesgue and Sobolev spaces permits us to reduce the problem to weighted Sobolev-Poincare inequalities on the unit disc. We prove discreteness of the spectrum and we obtain lower estimates of the first Neumann eigenvalue. Spectral stability estimates will be discussed also.

Joint with V. Pchelintsev and A. Ukhlov.

Compact embeddings of Smoothness Morrey spaces on bounded domains
Dorothee Haroske (Friedrich Schiller University Jena, German)
Thursday 16:00 Quantum M3
We study the compact embedding between smoothness Morrey spaces on bounded domains and characterise its entropy numbers. Here we discover a new phenomenon when the difference of smoothness parameters in the source and target spaces is rather small compared with the influence of the fine parameters in the Morrey setting. In view of some partial forerunners this was not to be expected till now. Our argument relies on wavelet decomposition techniques of the function spaces and a careful study of the related sequence space setting.

This is joint work with Leszek Skrzypczak from Poznan.

Weak regularity of the inverse under minimal assumptions
Stanislav Hencl (Charles University, Czech Republic)
Thursday 14:00 Quantum M3
Let $\Omega \subset \mathbb{R}^3$ be a domain and let $f \in BV_{loc}(\Omega, \mathbb{R}^3)$ be a homeomorphism such that its distributional adjoint is a finite Radon measure. We show that its inverse has bounded variation $f^{-1} \in BV_{loc}$. The condition that the distributional adjoint is finite measure is not only sufficient but also necessary for the weak regularity of the inverse. This is a joint result with A. Kauranen and R. Luisto.

Triebel–Lizorkin–Morrey spaces and differences
Marc Hovemann (Friedrich Schiller University Jena, Germany)
Friday 13:30 Quantum M2
The main subject of my talk will be the Triebel–Lizorkin–Morrey spaces $\mathcal{E}^s_{u,p,q}(\mathbb{R}^d)$ with $s \in \mathbb{R}$, $0 < p \leqslant u < \infty$ and $q \in (0, \infty]$. These function spaces are a generalisation of the original Triebel–Lizorkin spaces $F^s_{p,q}(\mathbb{R}^d)$ which you get if you replace the L_p-norm in the definition by the Morrey-norm. For $0 < p \leqslant u < \infty$ we denote the Morrey-norm by $\| \cdot |\mathcal{M}^u_p(\mathbb{R}^d)\|$. We can characterise the spaces $\mathcal{E}^s_{u,p,q}(\mathbb{R}^d)$ with the help of differences of order $N \in \mathbb{N}$, enoted by $\Delta^N_h f(x)$. So under the conditions $s > d \max\left(0, \frac{1}{p} - 1, \frac{1}{q} - 1\right)$ and $N \in \mathbb{N}$ with $N > s$ we get that a function $f \in L^{loc}_{\min(p,q)}(\mathbb{R}^d)$ belongs to $\mathcal{E}^s_{u,p,q}(\mathbb{R}^d)$ if and only if $f \in L^{loc}_1(\mathbb{R}^d)$ and

$$\|f|\mathcal{E}^s_{u,p,q}(\mathbb{R}^d)\|^{(1)} := \|f|\mathcal{M}^u_p(\mathbb{R}^d)\| + \left\| \left(\int_0^\infty t^{-sq} \left(\frac{1}{|B(0,t)|} \int_{B(0,t)} |\Delta^N_h f(x)| dh \right)^q \frac{dt}{t} \right)^{\frac{1}{q}} \middle| \mathcal{M}^u_p(\mathbb{R}^d) \right\| < \infty.$$

It turns out that some of the conditions on the parameter s are also necessary. So it is not possible to characterise the spaces $\mathcal{E}^s_{u,p,q}(\mathbb{R}^d)$ with the quasi - norm $\| \cdot |\mathcal{E}^s_{u,p,q}(\mathbb{R}^d)\|^{(1)}$ if either

$$s \leqslant 0 \quad \text{or} \quad s < d\frac{p}{u}\left(\frac{1}{p} - 1\right) \quad \text{or} \quad s \leqslant d\left(\frac{1}{q} - 1\right) \quad \text{or} \quad N \leqslant s\,.$$

Global higher integrability of the gradient of a minimizer with generalized Orlicz growth
Arttu Karppinen (University of Turku, Finland)
Thursday 16:00 Quantum M2
In this talk we discuss a higher integrability result in the context of generalized Orlicz spaces (also known as Musielak-Orlicz spaces). We assume that u is a minimizer of an obstacle problem

$$\mathcal{K}^f_\psi(\Omega) := \{u \in W^{1,\varphi}(\Omega) : u > \psi \text{ almost everywhere and } u - f \in W^{1,\varphi}_0(\Omega)\}$$

for an obstacle ψ and boundary function f. Under suitable assumptions on φ, we show that

$$\int_\Omega \varphi(x, |\nabla u|)^{1+\delta}\, dx < \infty$$

for some small $\delta > 0$.

MHD equations in a bounded domain
Maria Kania-Blaszczyk (University of Silesia, Poland)
Friday 16:00 Quantum M3
We consider the Dirichlet boundary value problem for the incompressible magnetohydrodynamical (MHD) system

$$\begin{aligned} u_t - \nu\Delta u + u \cdot \nabla u &= -\nabla p + b \cdot \nabla b, \quad x \in \Omega \subset \mathbb{R}^N,\, t > 0, \\ b_t - \eta\Delta b + u \cdot \nabla b &= b \cdot \nabla u, \quad x \in \Omega \subset \mathbb{R}^N,\, t > 0, \\ div\, u &= div\, v = 0, \\ u &= 0, \quad b = 0 \quad on\ \partial\Omega, \\ u(0,x) = u_0(x), &\quad b(0,x) = b_0(x), \quad x \in \Omega, \end{aligned}$$

in a bounded domain $\Omega \subset \mathbb{R}^N$ with C^2 boundary, where $N = 2, 3$. Here u is the velocity of the fluid flow and b is the magnetic field. These functions are the vector-valued functions of $x \in \Omega$ and $t \geqslant 0$ ($u(t,x) = (u_1(t,x), \ldots, u_N(t,x))$, $b(t,x) = (b_1(t,x), \ldots, b_N(t,x))$). The total pressure $p = p(t,x)$ is real-valued function of $x \in \Omega$ and $t \geqslant 0$. The constant $\nu > 0$ is the viscosity of the fluid and $\eta > 0$ is the magnetic diffusivity.
Using Dan Henry's semigroup approach and Giga-Miyakawa estimates we construct global in time, unique solutions to fractional approximations of the MHD system in the base space $(L^2(\Omega))^N \times (L^2(\Omega))^N$. Solution to MHD system are obtained next as a limits of that fractional approximations.
[1] M.B. Kania *MHD equations in a bounded domain*, submitted;
[2] Y. Giga, T. Miyakawa, *Solutions in L_r of the Navier-Stokes Initial Value Problem*, Arch. Rational Mech. Anal., 89 (1985), 267-281.

Variable exponent Triebel-Lizorkin Morrey spaces
Henning Kempka (University of applied Sciences Jena, Germany)
Friday 14:00 Quantum M2
We introduce morreyfied Triebel-Lizorkin spaces with variable exponents $\mathcal{E}^{\boldsymbol{w},u(\cdot)}_{p(\cdot),q(\cdot)}(\mathbb{R}^n)$. Here the smoothness is measured in the sense of admissible weight sequences and all parameters are variable.
Starting from the important convolution inequality we obtain first characterizations of these spaces with atoms and Peetre maximal functions.

Hölder continuity of weak type minimizers for functionals with generalized Orlicz growth
Mikyoung Lee (Pusan National University, South Korea)
Thursday 15:30 Quantum M2
In this talk, we discuss Hölder regularity of quasiminimizers and ω-minimizers of functionals with non-standard growth. Compared with previous results, it covers more general minimizing functionals and need fewer assumptions. This talk is based on the joint work with Petteri Harjulehto and Peter Hästö.

Orlicz Spaces and Generalized Orlicz Spaces
Jan Lang (The Ohio State University, USA)
Friday 14:30 Quantum XVII
We prove the compactness of the Sobolev embedding for Musielak–Orlicz spaces by way of simple conditions on the Matuszewska index of the underlying space. We provide counterexamples to show the sharpness of our conditions.

Relation between sublinear operators and their subdifferentials for certain classes of Lipschitz summability
Mezrag Lahcéne (M'sila University, Algeria)
Thursday 14:00 Quantum XVII
Let $SB(X,Y)$ be the set of all bounded sublinear operators from a Banach space X into a complete Banach lattice Y; which is a pointed convex cone not salient in $Lip_0(X,Y)$. In this paper, we interest to study the relation between T and the subdifferential $\bar{V}T$ (which is the set of all linear operators $u : X \to Y$ such that $u(x) \leqslant T(x)$ for all x in X); concerning certain notions of Lipschitz summability. We also ask negatively a question posed previously concerning this type of relation in the linear case. For this, we introduce and study a new concept of summability in the category of Lipschitz operators, which we call the super Lipschitz p-summing operators. We prove some characterizations in terms of a domination theorem and some properties of this concept.

Embeddings of homogeneous Sobolev spaces on the entire space
Zdeněk Mihula (Charles University, Czech Republic)
Friday 15:30 Quantum M2
We completely characterize the validity of the inequality $\|u\|_{Y(\mathbb{R}^n)} \leqslant C\|\nabla^k u\|_{X(\mathbb{R}^n)}$, where X and Y are rearrangement-invariant spaces, by reducing it to a considerably simpler one-dimensional inequality. Furthermore, we fully describe the optimal rearrangement-invariant space on either side of the inequality when the space on the other side is fixed. We also solve the same problem within the environment in which the competing spaces are Orlicz spaces. A variety of examples involving customary function spaces suitable for applications is also provided.

BMO estimates for the $p(x)$-Laplacian
Jehan Oh (Bielefeld University, Germany)
Thursday 14:30 Quantum M2
We study a limiting case of the nonlinear Calderón-Zygmund theory to the inhomogeneous $p(x)$-Laplace system. We prove local BMO estimates under the assumption that the variable exponent $p(x)$ satisfies the so-called vanishing log-Hölder continuity. The talk is based on joint work with Anna Kh. Balci and Lars Diening.

Strong well-posedness for the split variational inequalities
Morteza Oveisiha (Imam Khomeini International University, Iran)
Thursday 16:30 Quantum XVII
The classical concept of well-posedness for a minimization problem which first was introduced by Tykhonov in 1966, plays an important role in the theory of optimization problems. It requires the existence and uniqueness of solution to the minimization problem and the convergence of every minimizing sequence to the unique solution. In this talk, we generalize the concept of well-posedness to a class of split variational inequalities. Under very mild assumptions on involved operators, we obtain some metric characterization of well-posedness for the split variational inequalities. The obtained results generalize and improve some related theorems on well-posedness for variational inequalities in the literature.

Moser meets Gauss
Lubos Pick (Charles University, Czech Republic)
Friday 16:30 Quantum M2
We prove Moser-type estimates for Gaussian-Sobolev embeddings.

New Method of Smooth Extension of Local Maps on Linear Topological Spaces. Applications and Examples
Victoria Rayskin (Bentley University, USA)
Friday 16:00 Quantum M2
A known classical method of extension of smooth local maps uses smooth bump functions. However, such functions are absent in the majority of infinite-dimensional spaces. We suggested a new approach for Banach spaces, based on the composition with locally identical maps, which we call blid maps. In addition to smooth spaces, blid maps also allow to extend smooth local maps on non-smooth spaces, such as $C^q[0,1]$, $q = 0, 1, 2, ...$ We will show how to reconstruct a map from its derivatives at a point, for spaces possessing blid maps. We will also show how blid maps can assist in finding global solutions to cohomological equations having linear transformation of argument. In particular, we will discuss application of blid maps to local conjugation of maps. We will also discuss a possibility of generalization

of this method for topological linear spaces such as $C^\infty(\mathbb{R})$, applications of this theory and open problems.

On the Cauchy problem for a generalized Navier-Stokes equation with initial data in super-critical Besov and Triebel-Lizorkin spaces
Hans-Jürgen Schmeisser (Friedrich-Schiller University Jena, Germany)
Friday 16:30 Quantum M3
We study well-posedness of the Cauchy problem for a generalized Navier-Stokes equation with initial data in super-critical Besov and Triebel-Lizorkin spaces. We prove existence and uniqueness of mild and strong solutions which are local in time.

New function spaces to study perturbation problems for structured population dynamics
Jakub Skrzeczkowski (University of Warsaw, Poland)
Thursday 16:00 Quantum XVII
Structured population model are transport-type PDEs of the form:

$$\begin{cases} \partial_t \mu_t + \partial_x(b(x,\mu_t)\mu_t) & = c(x,\mu_t)\mu_t & \mathbb{R}^+ \times [0,T], \\ b(0,\mu_t) D_\lambda \mu_t(0) & = \int_{\mathbb{R}^+} a(x,\mu_t) d\mu_t(x) & [0,T], \\ \mu_0 & = \nu & \mathbb{R}^+. \end{cases} \tag{0.2}$$

describing various phenomena in Biology. Well-posedness theory for measure solutions was successfully developed in the space of bounded Radon measures $\mathcal{M}(\mathbb{R}^+)$ equipped with so-called flat metric (Gwiazda, Lorenz, Marciniak - Czochra; 2010). However, to the best of our knowledge, nothing is known about differentiability of map $h \mapsto \mu_t^h$ where μ_t^h solves (0.2) with perturbed model functions $a(x,\mu_t) := a^h(x,\mu_t^h) = a^0(x,\mu_t^h) + h a_p(x,\mu_t^h)$ and so on for functions b and c. Such questions are motivated by optimal control problems and sensitivity analysis. We start with a simple example when (0.2) reduces to transport equation:

$$\begin{cases} \partial_t \mu_t + \partial_x((1+h)\mu_t) & = 0 & \mathbb{R}^+ \times [0,T], \\ \mu_0 & = \delta_0 & \mathbb{R}^+. \end{cases} \tag{0.3}$$

to see that this type of result cannot be obtained in flat metric setting. Then, we move to the bigger space $Z = \overline{\mathcal{M}(\mathbb{R}^+)}^{(C^{1+\alpha})^*}$ which has been recently introduced to tackle similar question for transport equations (Gwiazda, Hille, Łyczek, Świerczewska - Gwiazda; 2018). We first prove Fréchet differentiability of $h \mapsto \mu_t^h$ in Z for linear version of (0.2) where implicit formula for solution to (0.2) is available. Finally, using approximating sequence and idea of "differentiability propagation" along time interval, we establish result for general nonlinear model (Skrzeczkowski; 2018)

Composition operators on Sobolev spaces and Neumann eigenvalues of non-linear elliptic operators
Alexander Ukhlov (Ben-Gurion University of the Negev, Israel)
Thursday 15:30 Quantum XVII
We consider estimates of the Neumann eigenvalues of non-linear elliptic operators in non-Lipschitz domains. This study is based on the geometric theory of composition operators on Sobolev spaces that permits us to estimate constants in the Sobolev-Poincaré inequalities and as an application to obtain lower estimates of the first non-trivial Neumann eigenvalues in Ahlfors domains (quasidiscs). This class of domains includes some snowflakes type domains with fractal boundaries. (Joint works with Vladimir Gol'dshtein and Valerii Pchelintsev)

Spline wavelet decompositions in function spaces with Muckenhoupt weights
Elena Ushakova (Computing Center of the Far Eastern Branch of the Russian Academy of Sciences)
Friday 14:30 Quantum M2
We consider function spaces of Besov or Triebel–Lizorkin type with weights belonging to some Muckenhoupt class $\mathcal{A}_\infty$. Wavelet decomposition of these spaces is performed by compactly supported linear combinations of elements of Battle–Lemarié spline wavelet systems. As an application of the decomposition result we discuss connections between norms of images and pre–images of integration operators. The research was supported by the Russian Foundation for Basic Research (project 19-01-00223).

Approximation of highdimensional functions
Jan Vybiral (Czech Technical University, Czech Republic)
Thursday 14:30 Quantum XVII
The approximation of smooth multivariate functions is known to suffer the curse of dimension. We discuss approximation of structured multivariate functions, which take the form of a ridge, their sum, or of the so-called sparse additive models. We give also results about optimality of such algorithms.

On some functional analysis results in Musielak spaces
Ahmed Youssfi (University Sidi Mohamed Ben Abdellah/National School of Applied Sciences, Marocco)
Friday 13:30 Quantum XVII
We present some recent results in Musielak-Orlicz spaces. Precisely, we give sufficient conditions for the continuity in norm of shift operator in Musielak-Orlicz spaces L_M. An application to the convergence in norm of approximate identities is given, whereby we prove density results of smooth functions in L_M, both in modular and norm topologies. Density results are then applied to get some basic topological properties.
We also presente an investigation about Poincaré-type integral inequalities in the functional Musielak structure. We give conditions on the Musielak functions under which they hold. An identification with null trace functions space is discussed. The talk is based on the references (1), (2).

(1) A. Youssfi and Y. Ahmida. Some approximation results in Musielak-Orlicz spaces. To appear in Czechoslovak Math. J.
(2) A. Youssfi and Y. Ahmida. Poincaré-type inequalities in Musielak spaces. To appear in Ann. Acad. Sci. Fenn. Math.

New characterizations of Morrey spaces and their preduals with applications to fractional Laplace equations
Wen Yuan (Beijing Normal University, China)
Thursday 16:30 Quantum M3
We characterize the Morrey spaces as well as their preduals via quadratic functions related to the Taylor remainder of the kernel of the Riesz potential. As applications, the authors obtain some strong capacitary inequalities, which are then used to study the regularity of the duality/weak solution to the fractional Laplace equation with measure data.