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Nota di contenuto	Part I Analysis -- A note on a Capelli operator and its resonance -- Schatten-von Neumann classes $Sp$ on the torus for $0 < p \leq 2$ -- Log-Sobolev and Nash inequalities on graded groups -- One-sided Hardy-Littlewood maximal function on generalised Lorentz spaces -- Remarks on gradient Yamabe solitons -- Boundedness of Fourier multipliers on fundamental domains of lattices -- Pointwise domination and weak $L^1$ boundedness of Littlewood-Paley operators via sparse operators -- $H^p$ $L^p$ boundedness of Fourier multipliers on graded Lie groups -- On a reverse integral Hardy inequality on polarisable metric measure space -- Logarithmic Sobolev inequalities of fractional order on noncommutative tori -- The Prabhakar fractional $q$ -integral and $q$ -differential operators -- A note on weak type boundedness of pseudo-differential operators on rank one symmetric spaces of noncompact type -- $L^p$ - $L^q$ norms of spectral multipliers -- Estimates for oscillatory integrals with discontinuous amplitude -- The unitary dual of the Heisenberg group over $R^p$ -- Critical Sobolev-type identities and inequalities on stratified Lie groups -- Part II Partial differential equations -- Anisotropic Picone type identities for general vector fields and some applications -- An equivalence between the Neumann

problem and its boundary domain integral equation systems for Stokes equations -- Short note on generalised bivariate Mittag-Leffler-type functions -- Inverse problems for time-fractional mixed equation involving the Caputo fractional derivative -- Time dependent inverse source problems for integrodifferential Kelvin-Voigt system -- A nonlocal initial conditional boundary value problem on metric graph -- Second-order semiregular non-commutative harmonic oscillators: the spectral zeta function -- Global well-posedness with loss of regularity for a class of singular hyperbolic Cauchy problems -- On a mixed equation involving Prabhakar fractional order integral-differential operators -- Inverse problem of determining a time-dependent source in a fractional Langevin-type partial differential equation -- Very weak solution of the discrete wave equation for harmonic oscillator -- An estimate for the multivariate Mittag-Leffler function -- Part III Mathematical modelling -- Mathematical modelling of the Lomb-Scargle method in astrophysics -- The application of physics informed networks to solve hyperbolic partial differential equations with nonconvex flux function and diffusion term -- Fractional differential equations: a primer for structural dynamics applications -- Text matching as time series matching -- Performing Particle Image Segmentation on an Extremely Small Dataset -- Two-dimensional dispersed composites on a square torus.

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#### Sommario/riassunto

This book offers an overview of the research results presented by group members and guests of the Ghent Analysis & PDE Center during the weekly seminar that took place from 2021 to 2022. It is an informal event of the Analysis & PDE Center and associated researchers, where everyone can present their work or relevant literature for about 20-30 minutes. The seminar aims to exchange ideas and foster effective learning and collaboration. In this book, group members and guests summarise their results presented during the seminar and provide outlooks for future work. In this way, the book also provides an overview of the recent developments in the Ghent Analysis & PDE Center. The main topics are functional analysis, Fourier analysis, noncommutative analysis, geometric analysis, partial differential equations of different types, harmonic analysis, functional inequalities, pseudo-differential operators, fractional derivatives, special functions, microlocal analysis, inverse problems and imaging. The target audience of this book is any researcher working in the above fields. .

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