

Special Issues to appear in Scientific Journals

related to

Quantum Physics with Non-Hermitian Operators

After many fruitful discussions during the International Seminar and Workshop on *Quantum Physics with Non-Hermitian Operators*, Dresden, June 15 - 25, 2011, the two scientific journals JOURNAL OF PHYSICS A and FORTSCHRITTE DER PHYSIK - PROGRESS OF PHYSICS plan to publish a Special Issue related to the topic of the conference. Both Issues are open to all interested physicists for original contributions. The length of all contributions is limited to 15 journal pages. All contributions to both Special Issues will be peer-reviewed. The two Issues differ in the ranges of topics considered, which are in accordance with the scope of the respective journals.

Journal of Physics A

Title of the Special Issue

Quantum Physics with Non-Hermitian Operators

Scope

Mathematical and theoretical, corresponding to the scope of the journal.

Focus on self-contained systems described by a non-Hermitian operator, with real or complex conjugate eigenvalues. PT symmetry.

Guest editors

Carl Bender (St. Louis, USA)

Andreas Fring (London, UK)

Uwe Günther (Dresden-Rossendorf, Germany)

Hugh Jones (London, UK)

Topics include

Theories described by non-Hermitian Hamiltonians being PT-symmetric and/or pseudo-Hermitian or quasi-Hermitian including

- spectral problems
- optical transparency in complex potentials
- construction of metric operators
- scattering theory
- supersymmetric theories
- Lie algebraic and Krein-space methods
- aspects of integrability and exact solvability
- random matrix models
- classical and semi-classical models and field theories with indefinite metric
- exceptional points in model systems

Deadline for submission

14 March 2012

Fortschritte der Physik - Progress of Physics

Title of the Special Issue

Quantum Physics with Non-Hermitian Operators: Theory and Experiment

Scope

Interdisciplinary, in accordance with the scope of the journal.

Focus on discussion and description of unexpected experimental results obtained in different fields of physics that could not be explained, or are not easily treated, in standard quantum mechanics with Hermitian operators. Description of open quantum systems (and systems equivalent to them) being embedded into a well-defined environment of scattering wavefunctions. Discussion of generic features such as the role of exceptional points and of dynamical phase transitions.

Guest editors

Jonathan Bird (Buffalo, USA)

Robin Kaiser (Nice, France)

Ingrid Rotter (Dresden, Germany)

Günter Wunner (Stuttgart, Germany)

Topics include

- open quantum systems at high level density and in the vicinity of particle emission thresholds
- exceptional points in quantum and classical systems and in Bose-Einstein condensates
- environmentally induced effects in quantum systems, aligned and trapped states
- dynamical (and superradiant) phase transitions
- phase rigidity of the eigenfunctions of a non-Hermitian Hamilton operator
- phase lapses in the transmission through quantum dots
- implementations of open systems using mesoscopic structures such as quantum dots and quantum point contacts
- violation of the Porter-Thomas distribution of reduced neutron widths

- violation of Fermi's golden rule
- spectral singularities and bound states in the continuum
- optical transparency in complex potentials
- open multimode systems
- Petermann factor
- collective Lamb shift
- exceptional points in lasers
- conformal gravity
- dephasing under different conditions
- cryptohermiticity
- problem of time (including uncertainty relation between time and energy)

Deadline for submission

31 March 2012