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Preface

The study of tidal disruption events (TDE) has traditionally been a minority discipline existing on the periphery of the greater fields of galactic nuclei and active galactic nuclei (AGN). Perhaps this has been due to the scarcity of observational data gathered (about 20 events to date), from what are intrinsically rare events. Nevertheless, the subject has the potential to give insights into the stellar populations and dynamics of galactic nuclei as well as the formation of accretion structures and jets which are not easily gathered from the confused environments of persistent AGN.

When observed at high spectral and temporal resolution with future missions, TDE will be a new potential probe of strong gravity in the immediate vicinity of supermassive black holes.

The recent discovery of the extreme TDE, Swift J1644+57, and the flurry of activity which this precipitated in prestigious journals, shows that there is a general appetite for learning about these spectacular systems. With this in mind, and with the prospect of increased numbers of detected events from new transient surveys, we felt that the time was right for a workshop dedicated exclusively to TDE - perhaps the first one ever. When planning the conference, it became clear that the overlap with high-variability AGN was great and an extra session was added to cover these objects. Superficially this was because of the possibility of misclassifying variability in an AGN as a TDE (and vice versa), but at a deeper level the two phenomena share some of the same physics; changes in accretion rate, in disk structure and in absorption complexes.

This workshop was designed to bring together theorists and observers for a review of previous observations and state-of-the-art modelling, and to help to develop a strategy for the identification and follow-up of future events.

The workshop addressed the following main topics:

- Observations: what giant flares have been seen to date in the X-ray, UV, optical and radio, and what are their key properties?
- Numbers: what are the stellar dynamics in galaxy cores, what is the expected rate of TDE and are they important for the universal fueling of (super)massive black holes?
- New missions/surveys: what is coming; how many objects will they find; what will they be able to measure and to what accuracy (e.g., LSST, PanStarrs, LAMOST, eROSITA, LOFAR, and other upcoming transient surveys)
- Theoretical explanations: Tidal disruptions, AGN disks, jets - what do they predict and what needs to be observed to test the models?
- Tidal disruption models: how does tidal disruption, tidal detonation and tidal stripping work? How much gas is accreted, how much expelled? Do strong disk winds develop, and when?
- Jets and radio emission: when and how are jets formed during a disruption? What is their evolution?
- Emission line light echoes from a nuclear flare: what can they tell us about the circum-nuclear material and the disrupted star itself?
- AGN outbursts: what are the mechanisms and are some of them related to tidal disruptions?
- Interaction of stellar or compact objects with an accretion disk: how to search for periodic flare patterns and characteristic thermal bremsstrahlung spectra?
- What are the sources of false alarms: changes in line-of-sight obscuration to AGN, supernovae, ultra-luminous X-ray sources (ULX), blazars, and gamma-ray bursts (GRBs), and how can we discriminate against them (or are they physically related)?
- Gravitational waves: what can be detected from stellar inspirals, partial disruption of compact stars, and binary black hole mergers?
- Applications: how can we use TDE to detect massive binary black holes and recoiling black holes? What do they tell us about stellar dynamics in galactic nuclei? What else can we use them for?
- How to plan a follow-up campaign: what needs to be observed and when? How can multi-wavelength efforts be optimally coordinated?

The organisation of this conference has been a great pleasure and we extend our warmest thanks to the invited speakers who accepted the challenge of introducing the various topics. We would like to thank the scientific and local organising committees for their valuable contribution and we gratefully acknowledge the financial and practical support of the ESAC faculty which made this event possible.

Finally we hope that the gathering of active researchers has helped to engender contacts between disparate groups that will help take this subject forward in the exciting years to come.

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