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The past and future power of the NOT to study tidal disruption events and their infrared echoes

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The study of tidal disruption events (TDEs) presents a new opportunity to investigate the nuclear regions of galaxies and the supermassive black holes (SMBHs) therein. The luminous outburst produced by the accretion of a star onto a SMBH heats nearby interstellar dust, which then re-radiates this energy producing a so-called infrared (IR) echo. Observations of IR echoes, and the outbursts which cause them, can reveal the geometry and quantity of the surrounding dust, as well as the intrinsic energy released by the TDEs themselves, as the dust efficiently absorbs and re-emits UV photons that would otherwise remain unobserved.

The recent emergence of the field of study of optical TDEs over the past decade has also led to the discovery of associated IR echoes, enabling the study of dust in the nuclear regions of TDE host galaxies. Additionally, the recent discoveries of particularly long lasting and luminous IR echoes in the heavily obscured nuclei of luminous infrared galaxies has revealed the presence of TDEs that could never be discovered through optical or UV observations alone. Here we present our use of the IR observing capabilities of the NOT+NOTCam to systematically discover and follow IR echoes from TDEs. Furthermore, we describe the exciting future capabilities of the NTE instrument to continue this work and how its simultaneous coverage of the optical and IR range will be especially well suited to very efficiently characterise the spectral energy distribution of TDEs and their associated IR echoes.

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