Role of wind clumping for mass loss from massive stars (#905)

Jon Sundqvist[1]

[1]KU Leuven, Lueven, Belgium

Massive-star evolution is highly regulated by mass loss. This talk focuses on the role played by wind inhomogeneities ('clumping') for the mass-loss rates from line-driven winds of hot, massive stars. Such wind clumping arises naturally from the strong, inherent instability of line-driving, and affects the atmospheric structure as well as the radiative transfer needed to derive synthetic observables. Indeed, neglecting clumping typically leads to observationally inferred mass-loss rates that differ by more than an order of magnitude for the same star, depending on which spectral diagnostic is used to estimate this mass loss. In this talk I will first present a novel, very fast technique for treating such clumping in state-of-the-art, global NLTE atmosphere codes. This method accounts properly for the leakage of light that can occur through porous channels between optically thick clumps -- in physical and/or velocity space -- where the latter can be particularly important when deriving mass-loss rates from observations of strong UV resonance lines. The talk then concludes by comparing some first results from our new diagnostic methods with some equally new predictions for mass loss from updated wind models based on full co-moving frame radiative transfer to derive the radiative acceleration.