# The effect of multi-scale roughness on the structure of atmospheric turbulence

**Lead Supervisor:** Dr Marco Placidi, University of Surrey, Mechanical Engineering Sciences.
Email: m.placidi@surrey.ac.uk

**Co-supervisors:** Prof. Sue Grimmond, University of Reading, Department of Meteorology.
Prof. Alan Robins, University of Surrey, Mechanical Engineering Sciences.
Dr Humphrey Lean, Met Office.

It is estimated that "the cities of the future" will host an increasing percentage of the world's population thanks to the proliferation of tall buildings that maximise the provision of housing and office per footprint area. These buildings and their characteristic geometries shape the atmospheric turbulence influencing both the pedestrian comfort and the air quality at street level. However, studies on realistic city layouts are rare. A series of wind tunnel experiments within the EnFlo Laboratory, at the University of Surrey, is envisaged to explore the effect of different geometric features of these tall buildings on the structure of the atmospheric turbulence, and ultimately, to inform policy makers on urban air quality. Please contact the lead supervisor, Dr Marco Placidi (m.placidi@surrey.ac.uk), for further information on this project.

*Figure 1: Dubai under a dense cloud at dawn. Credit: Daniel Cheong Photography.*

**Training opportunities:**
Specialised MSc modules on various aspects of atmospheric fluid mechanics are available at both the Universities of Surrey and Reading. Doctoral candidates at the University of Surrey are also supported via a number of research-related workshops. It is recommended that the student will also engage with opportunities within NCAS (http://www.met.reading.ac.uk/nercdtp/home/training/). A short industrial placement at Met office will also be arranged.

**Student profile:**
We are seeking candidates with a first-class degree or a good 2:1 in a relevant engineering field (aeronautics, environmental, civil, mechanical) or physical/environmental science (physics, meteorology), with excellent communications skills. Previous experience with experimental work and computer programming would be beneficial.

## References:
Please visit the following webpage for further information: http://www.met.reading.ac.uk/nercdtp/home/