

**GOL-18 Conference.**

**Plenary session:**

## **Some combinatorial problems arising in emergency management**

Emergency Operational Research covers all operational research techniques used in emergency management. Large scale emergency situations share some common features, in particular the fact that one needs to take decisions impacting lives and goods with a lack of resources, strict time constraints and in highly disrupted environment (in particular with lack of information).

This talk presents some recent researches done in the frame of the European RISE project GEO-SAFE (Geospatial based Environment for Optimisation Systems Addressing Fire Emergencies) between Europe and Australia that focuses on wildfire emergencies.

In this frame the different problems can be divided into four main phases: mitigation, preparedness, response and reconstruction. We will mainly consider typical examples in mitigation - in particular for fuel management - and in the response phase - in particular for fire attack and lives and goods protection. While most of the current approaches for these problems use integer linear approaches, we will investigate complementary models, in particular graph models, that allow to take into account the structure of the instances to be solved.

Most of the problems we then have to handle involve planar graphs or even restricted subclasses. Our main aim is to study in which extend the structure of these particular instances has an impact on the possibility to solve them efficiently.