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Achievements and opportunities from ESF Research Networking Programme: Natural molecular structures as drivers and tracers of terrestrial C fluxes, and COST Action 639: Greenhouse gas budget of soils under changing climate and land use

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One of the activities of the European Science Foundation (ESF, www.esf.org) is developing European scale Research Networking Programmes (RNPs). RNPs lay the foundation for nationally funded research groups to address major scientific and research infrastructure issues, in order to advance the frontiers of existing science. MOLTER (www.esf.org/molter or www.molter.no) is such an RNP. MOLTER stands for "Natural molecular structures as drivers and tracers of terrestrial C fluxes" aims at stimulating the use of isotopic and organic chemistry to study carbon stabilization and biogeochemistry in terrestrial ecosystems and soils in particular. The understanding of the formation, stabilization and decomposition of complex organic compounds in the environment is currently being revolutionized by advanced techniques in identification, quantification, and origin tracing of functional groups and individual molecules.

MOLTER focuses on five major research themes:
- Molecular composition and turnover time of soil organic matter;
- Plant molecular structures as drivers of C stabilisation in soils;
- Fire transformations of plant and soil molecular structures
- Molecular markers in soils;
- Dissolved organic molecules in soils: origin, functionality and transport.

These research themes are covered via the following activities:
- Organisation of international conferences;
- Organisation of specific topical workshops;
- Organisation of summer schools for PhD students;
- Short- and long-term exchange grants for scientists.

MOLTER is supported by research funding or performing agencies from Austria, Belgium, France, Germany, the Netherlands, Norway, Romania, Spain, Sweden, Switzerland and the United Kingdom.

The ESF is also the implementing agency of COST (European Cooperation in Science and Technology, www.cost.esf.org), one of the longest-running European instruments supporting cooperation among scientists and researchers across Europe. COST Action 639 "Greenhouse gas budget of soils under changing climate and land use" (BurnOut) (www.cost.esf.org/domains_actions/essem/Actions/changing_climate or bfw.ac.at/rz/bfwcms.web?dok=5906) BurnOut aims at improving the management of greenhouse gas emissions from European soils under different regimes of ecosystem disturbances and land-use change. This will allow the identification of soil and site conditions (hot spots) that are vulnerable to greenhouse gas emissions.

The specific objectives are:
- Identification of hot spots of greenhouse gas emissions from soils;

- Identification of soil and site conditions that are vulnerable to GHG emissions;
- Development of an advanced greenhouse gas reporting concept across different of land forms, land use and land use changes;
- Communication of policy relevant GHG reporting concepts; Burnout covers the following activities:
- Organisation of specific topical workshops;
- Short-term scientific visits for scientists.

Participating countries in BurnOut are: Austria, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Finland, Germany, Greece, Hungary, Ireland, Israel, Italy, Lithuania, Netherlands, Norway, Portugal, Romania, Slovak Republic, Slovenia, Spain, Spain, Sweden, Switzerland, Turkey, United Kingdom, Russian Federation, and Bosnia Herzegovina.

During this oral presentation, possible lines of cooperation, opportunities and recent achievements will be exemplified and the audience will be invited to contribute their views on these initiatives.