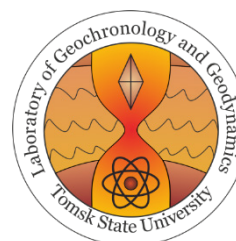


МИНИСТЕРСТВО НАУКИ И ВЫСШЕГО ОБРАЗОВАНИЯ РОССИЙСКОЙ ФЕДЕРАЦИИ
НАЦИОНАЛЬНЫЙ ИССЛЕДОВАТЕЛЬСКИЙ
ТОМСКИЙ ГОСУДАРСТВЕННЫЙ УНИВЕРСИТЕТ



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METALLOGENY AND OIL-GAS, PLANETARY ANALOGUES
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ИЗМЕНЕНИЯ, МЕТАЛЛОГЕНИЯ, ФОРМИРОВАНИЕ НЕФТИ И ГАЗА,
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NEW ILP TASK FORCE (2019-2024): LITHOSPHERIC STRUCTURE AND MINERAL RESOURCES

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Introduction

Geological, geodynamic and tectonic processes that define and control the lithosphere structure and evolution are closely related to deposition of minerals, many of which occur only in specific lithospheric settings. Recent technological shifts and the depletion of mineral resources put pressure on the mineral exploration industry which is experiencing a boom in activity over the past decade. This boom is also associated with breakthroughs in mineral exploration which build on new fundamental results in geophysics, geochemistry, and geodynamics.

Significant efforts are being put forward internationally and nationally, e.g. at the scales of national geological surveys, to bridge mineral exploration and the academic community. However, the results of the academic research are not used at full by the mining industry. On the other side, a significant part of the fundamental research does not target practical application of the results by the mineral exploration community and the step between the academic result and its possible application is often missing.

New ILP Task Force

The objective of the new ILP Task Force (2019-2024) is to provide a new framework for mineral exploration targeting. This requires detailed knowledge on the lithosphere-scale structure, including detailed knowledge of the crust, together with the improved and enhanced understanding of the impact of various plate tectonics and mantle dynamics processes on the lithosphere composition and architecture.

The new ILP Task Force will focus primarily on magmatic ore deposits on continents, which are mostly associated with large igneous provinces, continental collisional orogens, Precambrian cratons, and paleo-subduction systems. Other tec-

tonic settings, such as the Arctic shelf, may also be included as a sub-task of the new Task Force.

Magmatic ore deposits are formed during crystallization of a magma. They are linked to magmatic processes associated with either plate tectonic settings (collisional orogens and subduction systems), or with mantle hotspots and plumes (large igneous provinces); some may also be associated with large-scale impacts that cause intensive lithosphere heating and melting. All these processes create and modify the structure and composition of the crust and the lithosphere mantle, and therefore can be recognized by high-resolution geophysical models. Geological data combined with geochemical studies provides constraints on geodynamic processes responsible for formation and deposition of ore deposits. These processes can be tested by numerical modeling which provides important constraints on the details of magmatic processes and their impact on the lithosphere structure and composition.

Conclusions

The goal of the new Task Force fits the mission of the ILP in:

- addressing the connections between the deep Earth ore-forming processes, lithosphere structure and mineral deposits at the near-surface;
- building on interdisciplinary research which includes collaboration between geology, geophysics and geochemistry;
- building on the integration of geophysical imaging of the crustal and upper mantle structure with tectonic reconstruction of processes that form and modify the lithosphere and with geodynamic modeling of these processes.

We invite a broad international geoscience community to join us in the new ILP Task Force !