# The 2019 Technology Transfer Society Annual Conference
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**Session 3.3 – Chair: Catherine Beaudry**
**Location – B019**

**Title:** The fountain of knowledge: An epistemological perspective on the growth of U.S. SBIR-funded firms

**Authors:** David B. Audretsch, Albert N. Link

**Presenter:** Albert N. Link

**Abstract:**

The premise of this paper is that a basis for firms receiving Small Business Innovation Research (SBIR) research awards to develop commercializable technologies is not only their proposed creative ideas but also their endowment of attendant knowledge necessary to develop the technology being proposed. Based on this premise, we propose that those firms that have higher growth rates attributable to their SBIR awards are also those firms that are more creative and have more knowledge endowments. Empirically, we quantify a firms creativity and its sources of research knowledge in terms of its past experiences, and we find that firms with more technical experience and sector experience are those that have realized higher growth rates from their SBIR-funded research.

**Title:** Negotiated settlements among stakeholders: Creating capacity to confront disruption

**Authors:** Anita M. McGahan, James Shaw, Payal Agarwal

**Presenter:** Anita M. McGahan

**Abstract:**

In the face of disruption, adaptation and innovation by organizations that perform critical functions in the economy, such as the provision of electricity, public transportation, and health care, are essential for sustainability. Large, complex organizations face significant barriers when innovation has implications for the organization's architecture. In this paper, we address how such organizations succeed in overcoming these barriers, even when innovation raises the risk of organizational failure. We draw on insights about organizational routines and from stakeholder theory to outline a process by which absorptive capacity can be actively managed within large, complex core infrastructure organizations. We propose the concept of a *negotiated settlement* among stakeholders as critical to the innovation and adaption process. In a negotiated settlement, stakeholders develop understandings of the consequences of innovation for claimancy rights, and trade formally and informally to accomplish a mandate for change in the face of core threats to the organization's survival. By generating demand for innovation, this mandate constitutes an active component of absorptive capacity. We outline the implications of such a process for management theory on absorptive capacity and architectural change, as well as practical implications for organizations and the inter-institutional systems in which they are embedded.

**Title:** Do collaboration lead to more innovative ideas?

**Authors:** Rune Dahl Fitjar, Nina Hjertvikrem, Yuko Onozaka

**Presenter:** Nina Hjertvikrem

**Abstract:**

Public funding for research aims to promote the generation of new knowledge and new ideas which are useful for society. Research is increasingly done in large collaborative projects, often integrating firms or government agencies as well as research organisations. This is particularly the case for projects relying on public funding. However, little research has explored how collaboration affect the novelty of the projects. Collaboration may bring new ideas and perspectives to a research project, enhancing the generation of new knowledge. However, collaboration also involves compromises. Consequently, projects that include a wide range of different partners may be more conventional than individual projects, where the creativity of the researcher is allowed to blossom more freely and unchecked. The characteristics of collaboration partners may also matter. Collaboration within the similar types of partners, in terms of organization format, geographic locations and discipline, may result in more conventional projects than collaborations among heterogeneous partners.

In this paper, we examine these relationships using data from project abstracts and collaboration networks in projects financed by the Research Council of Norway. We text-analyze half a million words in 3,600 abstracts in six subject areas to assess the novelty and conventionality of each abstract. Then, we investigate how the novelty and the conventionality of the abstract are related to the characteristics of the collaboration networks, in terms of the partner types (university, research institutions, industry, government agencies, etc.), geographic locations (local, regional and international), and interdisciplinarity. As our initial step, we measure the novelty and the conventionality of the abstract by looking at how rare or common for a word to appear in abstracts in a subject area, represented by the inverse document frequency (*idf*). Then, we construct a novelty measure as the mean of the entire word distribution of the abstract (minus stop words) and corresponding *idf*. A high novelty measure implies that the abstract has a high occurrence of atypical words. Similarly, we construct the conventionality measure as the proportion of words within the abstract that has zero *idf*, so the higher conventionality measure implies that the abstract consists of words that are extremely common across all abstracts in the subject area.

Our preliminary analyses show that abstracts mainly comprise of conventional words, with varied occurrence of novel words. We also find that collaboration in general, and collaboration with actors in other geographic locations even more, leads to *more conventional* abstracts, implying the presence of *compromise* in collaboration processes. We will continue our investigation of abstract texts using word co-occurrence to identify the novel and conventional ideas and their relations to collaboration networks. Such approach allows us to look at the distribution of word pairs, rather than single words within an abstract, to bring in additional insights.

**Title:** Bolstering the capacity to innovate at Canadian post-secondary institutions through research infrastructure funding

**Authors:** Stéphane Mercure, Patrick MacGuire, Laura Hillier

**Presenter:** Stéphane Mercure

**Abstract:**

The Canada Foundation for Innovation (CFI) awards funding to strengthen the research infrastructure in universities, colleges, research hospitals and non-profit research organizations across Canada. Through its funding, the CFI is expected to provide Canadian researchers in all disciplines the facilities and equipment to undertake world-class research and technology development that supports private sector innovation and commercialization.

The Performance, Analytics and Evaluation unit of the CFI has recently undertaken a study to assess the organization's contribution to the innovation ecosystem. The CFI uses project progress reports submitted annually to gather information on the outputs and outcomes of projects it funds. Data collected from 4,246 projects through 11,161 PPR's submitted between 2012 and 2017 was analyzed to assess the contribution of research supported by CFI-funded infrastructure to the protection and transfer of intellectual property (IP), and the establishment of spin-off companies.

Our analysis has shown that nearly one out of five CFI-funded infrastructure projects (739) contributed to the innovation ecosystem through the creation, transfer and exploitation of intellectual property. Of the 576 projects that indicated IP rights, a total of 1,956 contributions in the form of provisional patents, patents, trademarks, copyrights as well as other forms of protection were disclosed. Licensing agreements and spin -off companies were reported by 219 and 215 projects respectively. In total, 324 unique spin-off companies were reported between 2012 and 2017.

CFI-infrastructure was shown to yield contributions to innovation in all three major fields of science. Approximately 19% of projects in the health sciences and in natural sciences and engineering (NSE) reported at least one IP right, licensing agreement or spin-off company. Projects in the social sciences and humanities were less likely to report contributions to innovation (7% of projects) particularly in the form of IP rights.

Contributions to innovation were also shown to grow steadily with award value; 46% of projects that received a CFI award valued at $1 million or more reported contributions to innovation compared to 13% for projects with a value under $200,000.

We are currently conducting interviews with a select group of researchers and institutional representatives to learn more about the contribution of research infrastructure to innovation as well as the process and outcomes associated with the creation, transfer and exploitation of intellectual property reported to the CFI. The findings from these interviews as well as the broader implications of the results of the full study will be discussed.