

Innovation and Intellectual Property Laboratory

The *Innovation and Intellectual Property Laboratory (INIP Lab)* consists of an interdisciplinary group of researchers at Skoltech whose scholarship, empirical research and innovative activity are united by a focus on the role of intellectual property in the process of technological innovation. The members of the Laboratory are drawn from a variety of academic fields and disciplines, including strategic management of technology, entrepreneurial strategy, intellectual property management, intellectual property law, business law, industrial engineering, aerospace engineering, organization studies, product development, information science, the management of complex systems, and innovation studies more generally (with some active in multiple fields). These researchers, despite the diversity of their skills, knowledge and backgrounds, work together in a common academic domain, which is *innovation and the management of intellectual property*.

Intellectual Platform of the *Innovation and Intellectual Property Laboratory*

The research and innovation agenda of the *Innovation and Intellectual Property Laboratory* is based on the following four core convictions:

1. Technological innovation, including technology entrepreneurship and the commercialization of science and technology, requires sophistication and prowess in managing intellectual property.
2. Expertise in the management of intellectual property matters not just for lawyers, but also for a wide range of people involved in innovation, including: technology entrepreneurs, managers of established technology-intensive corporations, product designers, investors, technology-transfer professionals, R&D managers, innovation-oriented academic researchers, regional innovation infrastructure professionals, IP traders and specialized IP intermediaries, technology marketing professionals, software and IT service providers, and also public policy leaders.
3. The management of intellectual property is already established as a vibrant functional domain in industry; and while academia has been much slower than industry in recognizing the central importance of IP management as a professional field, academia is beginning to catch up with industry in recognizing this field of management as a distinct function in business that deserves serious study in its own right, just like any other practical subject matter in business.
4. *Intellectual Property Management* is becoming visible as a new academic field, and systematic high-quality research about the strategic management of intellectual property, within the process of *technological innovation*, is a field in which Skoltech can make an intellectual and practical contribution, both within Russia and internationally.

Current Research Projects of the *Innovation and Intellectual Property Laboratory*

- Management of intellectual property in large-scale complex technological organizations and technological systems
- The role of intellectual property in collaboration agreements between technology intensive corporations and their suppliers and partners
- Outward-bound international patenting behavior and national economic development
- Patent strategy for modular products and systems
- Legal issues in the patenting of intangible technology
- Intellectual property strategy, dynamic capabilities and international competition

- Implications of recent trends in the law of patent-eligible subject matter on the strategies of entrepreneurial technology firms
- Patent analysis as a tool for planning scientific and engineering research projects
- Intellectual property and open-innovation
- Strategies for solving the problems of backlog and unreliable examination quality in the global patent system
- Intellectual property strategy and entrepreneurial technology strategy
- The historical relationship between technology and science in the development of energy conversion technology
- The integration of intellectual property considerations in to the engineering design process
- History of the field of quantum technology, as seen through the lens of patent data
- Intellectual property and technology transfer from universities and research institutions.

Previous Research Projects of the *Innovation and Intellectual Property Laboratory*

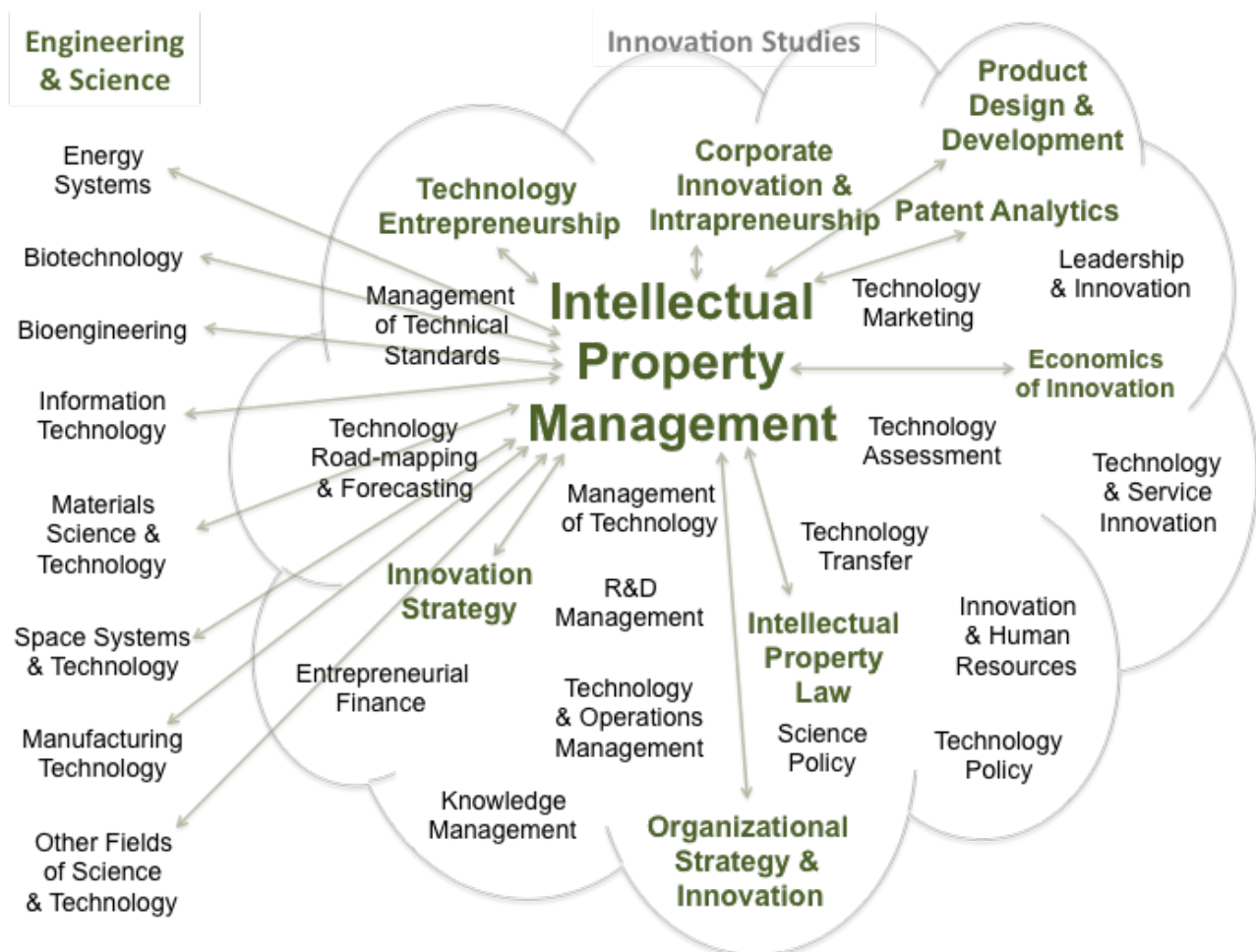
- Co-creation as an organizational strategy for new product development
- Intellectual property rights and information technology, with a special emphasis on the protection of computer software inventions and issues related to software-as-service
- Development of a context-enhanced patent analytics platform
- Smart patent analysis for technology strategy and business intelligence (use of “big data” analytics for evaluation of patent information)
- The role of intellectual property management in the international commercialization of lithium-ion battery technology
- International licensing strategy and IP management in the satellite data industry
- Legal issues in the localization of personal data in cloud computing services
- Patent-eligible subject matter and innovation in biomedical technology
- The strategic management of intellectual property in the development of digital gaming platforms for online education
- Entrepreneurial ecosystems in Russia and strategies for the development of university-based innovation
- Valuation of inventions through statistical analysis of patent data.

The *INIP Lab* meets periodically at Skoltech for round-table academic seminars on research related to innovation and intellectual property. Distinguished academic or practitioner guests sometimes also makes presentations. The purpose of these seminars is fourfold: (a) to provide constructive criticism of the research of each member of the group to improve the quality of his or her research and enhance the quality of subsequent publications; (b) to build up a shared intellectual territory and research culture at Skoltech in the field of innovation and intellectual property management; (c) to act as a seed-bed for ideas for future externally funded collaborative research projects; and, (d) to assist Ph.D. students to learn the art of carrying out academic research in a collegial academic environment. The seminars also constitute a practical component of the *Innovation and Intellectual Property Studies Doctoral Seminar*, which is a compulsory component of Skoltech’s Ph.D. program in Innovation and Intellectual Property Management.

Research Strategy of the *Innovation and Intellectual Property Laboratory*

The research strategy of the *INIP Lab* is based on recognizing that *Intellectual Property Management* is both an academic field in its own right and a lively zone for the interaction of other academic fields. Additionally, intellectual property management is a core function of the technological innovation process in business, making it centrally important to the academic mission of Skoltech. Intellectual property management lends itself to interdisciplinary research both within the domain of innovation studies and between innovation studies and fields of scientific and engineering research at Skoltech, such as bioinformatics, computer vision, data science, materials science & engineering, quantum technology, photonics, engineering design and energy technology, etc. Thus, academic work in intellectual property management may help synergize and facilitate practical innovation from scientific and engineering research at Skoltech. It may also be a focus for cooperation between our Laboratory and the various CREIs (Centers for Research, Education and Innovation) at Skoltech. *Intellectual Property Management* research at Skoltech is an integral part of the broader field of innovation studies.

Developing Innovation Studies by Leveraging Intellectual Property Management Research



Skoltech’s *INIP Lab* serves the distinctive internationally-oriented innovation mission of Skoltech, developed in partnership with MIT, by concentrating our efforts in a sub-field of innovation studies where there is great opportunity for us to leverage our resources for maximum impact, both in Russia and internationally. That field is intellectual property management.

Skoltech's *INIP Lab* and Russia's Innovation Economy

There is a groundswell of interest in intellectual property emerging in Russia, including the topic of how Russian technology enterprises may flourish by skillfully utilizing the IP systems and markets of the rest of the world, as well as those of Russia. The extraordinary interest shown by the Russian public in Skolkovo's *IP Academy* is one indication of that interest. Russia's accession to the World Trade Organization, with the obligations that that has brought with it for Russia to fully develop its IP laws and institutions, is also a factor. Russia's serious moves in this direction have also been recognized by the UN's Geneva-based World Intellectual Property Organization, that has opened a satellite office in Moscow, located in Skolkovo. The *IP Center* of the Skolkovo Foundation is also active in this field, and provides relevant and useful IP management services to innovative enterprises in the broader Skolkovo community. We envision that by cultivating relationships with the range of institutions and people in Russia who are thirsty for knowledge about intellectual property and its role in technology-related business, we will find a welcome outlet for both our research and practical education-and-training services related to our research.

Current Academic Members of Skoltech's *INIP Lab*

- Prof. Dr. Kelvin W. Willoughby, Professor & Director
- Punyapat Saksupapchon, Doctoral Researcher
- Georgy Klushin, Doctoral Researcher
- Nadezhda Mullina, Doctoral Researcher
- Elena Petrakova, Doctoral Researcher
- Aleksei Kalinichenko, Doctoral Researcher
- Zeki Can Seskir, Research Associate
- Dr. Dmitry Smirnov, Research Associate
- Prof. Dr. Barbara Igel, Fellow (Professor, Moscow School of Management)

International Academic Associates & Visitors in Projects of Skoltech's *INIP Lab*

- Prof. Dr. Gloria Barczak, Northeastern University, USA
 - Prof. Dr. Johann Füller, University of Innsbruck, Austria
 - Prof. Dr. Thomas Hustad, Indiana University, USA
 - Prof. Dr. Katja Hutter, University of Salzburg, Austria
 - Prof. Dr. Martin G. Möhrle, University of Bremen, Germany
 - Dr. Frank Teitz, University of Cambridge, United Kingdom
 - Assoc. Prof. Dr. Stephane Tywoniak, University of Ottawa
 - Dr. Alistair Scott, Vice President for Intellectual Property, Airbus, France
 - Prof. Dr. Maurizio Sobrero, University of Bologna, Italy
 - Prof. Dr. Maximilian von Zedtwitz, Copenhagen Business School, Denmark
 - Prof. Dr. Mette Præst Knudsen, University of Southern Denmark
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Relevant Publications of Present and Past Members of Skoltech's *INIP Lab*

Published Academic Papers and Monographs

- Punyapat Saksupapchon & Kelvin W. Willoughby, "Contextual Factors Affecting Patent Licensing Provisions in Collaboration Agreements of Complex Technological Organizations,"

International Journal of Intellectual Property Management (accepted for publication, in print, 8 June 2020).

- Punyapat Saksupapchon & Kelvin W. Willoughby, “Intellectual Property Management, Dynamic Capabilities and Competitive Innovation in the Commercial Aircraft Industry,” *International Journal of Intellectual Property Management* (accepted for publication, in print, 12 May 2020).
- Kelvin W. Willoughby, “Endogenous innovation, outward-bound international patenting and national economic development,” *Journal of Technology Transfer*, 45, 3 (2020), 844–869. <https://doi.org/10.1007/s10961-018-9705-1>
- Anja Tekic & Kelvin W. Willoughby, “Configuring intellectual property management strategies in co-creation: A contextual perspective,” *Innovation: Organization and Management*, 22, 2 (2020), 128-159. <https://doi.org/10.1080/14479338.2019.1585189>
- Kelvin W. Willoughby, *Technology Choice: A Critique of the Appropriate Technology Movement* (London: Routledge, 2019). ISBN 9780367289690 (Hardback), 9780429308444 (eBook). 350 pages.
- Anja Tekic & Kelvin W. Willoughby, “Co-creation — child, sibling or adopted cousin of open innovation?” *Innovation: Organization and Management*, 21, 2 (2019), 274-297. <https://doi.org/10.1080/14479338.2018.1530565>
- Kelvin W. Willoughby, “What Can Be Patented? Technological Innovation and the Contemporary Mess in Patent Law,” pp. 171-178 of ИНТЕЛЛЕКТУАЛЬНЫЕ ПРАВА: ВЫЗОВЫ 21-го ВЕКА, Материалы Международной конференции, 14–16 ноября 2019 г., Под редакцией Э.П. Гаврилова, С.В. Бутенко (Томск: Издательский Дом Томского государственного университета, 2019). DOI:10.17223/9785946218559/26
- Anja Tekic & Kelvin W. Willoughby, “Contextualized co-creation: Innovating with individual external contributors throughout the product life cycle,” *International Journal of Product Development*, 22, 3 (2017), 230-245. <https://doi.org/10.1504/IJPD.2017.087380>
- Kelvin W. Willoughby, *What Can Be Patented? Confronting the Confusion in Patent Law About Patent-Eligible Subject Matter* (Saarbrücken: Scholars Press, 2014). [book]
- C. F. Cheung, W. M. Wang, X. Xu & Kelvin W. Willoughby, “A knowledge-based system for assessing and managing intellectual property managerial risks for small-and-medium sized technological enterprises,” *International Journal of Intellectual Property Management*, 7, 1/2 (2014), 57–83. <https://doi.org/10.1504/IJIPM.2014.062795>
- Kelvin W. Willoughby, “What impact does intellectual property have on the business performance of technology firms?” *International Journal of Intellectual Property Management*, 6, 4 (2013), 316-338. <https://doi.org/10.1504/IJIPM.2013.057634>
- Kelvin W. Willoughby, “Intellectual property management and technological entrepreneurship,” *International Journal of Innovation and Technology Management*, 10, 6 (2013), 1-42. <https://doi.org/10.1142/s0219877013400270>
- Maximilian von Zedtwitz, Zeljko Tekic and Kelvin W. Willoughby, “Foreign R&D Investment in Russia: How to Translate into Innovation?” in *The Life of Russian Business: (Re)cognizing, (Re)activating and (Re)configuring Institutions*, edited by Tomas Casas i Klett and Yuliya Ponomareva (Information Age Publishing Inc., 2018), pages 141-146. ISBN-10: 164113450X ISBN-13: 978-1641134507
- A. V. Pilicheva, et al., *Intellectual property. A textbook for students*. MSAL named after O.E. Kutafin, Moscow, 2015. [in Russian]
- A. V. Pilicheva, et. al, *Patent protection for medicines*, Collection of the Russian School of Private Law alumni papers (Moscow, Statut, 2015). [in Russian].

- A. V. Pilicheva, “About the legal definition of ‘medicine’,” Collection of abstracts of the 2nd Moscow legal forum, *State sovereignty and the rule of law: international and national dimensions*, MSAL named after O.E. Kutafin, Moscow, 2015.
- A. V. Pilicheva, “The lifetime of the patent for medicine,” *Intellectual property. Industrial property*, 2015, No. 8, 47- 56. [in Russian].

Conference Papers, Working Papers and Publications in Progress

- Dmitry S. Smirnov & Kelvin W. Willoughby, “What Comes First, Technology or Science? Clues from the Field of Energy Conversion Technology,” *INIP Working Paper* (under review for journal: *Technological Forecasting and Social Change*, July 2020).
- Kelvin W. Willoughby & Nadezhda Mullina, “Reverse Innovation, International Patenting and Economic Inertia: Constraints to Appropriating the Benefits of Technological Innovation,” *INIP Working Paper* (under review for journal: *Research Policy*, June 2020).
- Anja Tekic, Kelvin W. Willoughby & Johann Füller, “Customized to Fit: Intellectual Property Management in Innovation-focused Co-creation Projects,” *The Journal of Product Innovation Management* (revise and re-submit, March 2020).
- Punyapat Saksupapchon & Kelvin W. Willoughby, “The Evolution of Patent Application Strategies of Companies in Commercial Aircraft Industry Through a Dynamic Capability Lens,” Paper for *IEEE 4th Technology Innovation Management and Engineering Science International Conference (TIMES-iCON 2019)*, Faculty of Engineering, Mahidol University, Bangkok, Thailand, 11-13 December 2019.
- Punyapat Saksupapchon & Kelvin W. Willoughby, “Contextual Factors Affecting Decisions About Intellectual Property Licensing Provisions in Collaboration Agreements for Open Innovation Projects of Complex Technological Organizations,” Paper for the *2019 IEEE International Symposium on Innovation and Entrepreneurship (TEMS-ISIE)*, Hangzhou, China, 24-26 October 2019.
- Anja Tekic & Kelvin W. Willoughby, “Intellectual property management in co-creation: Exploring the value of contextual and configurational perspectives for the development of strategy by employing the Qualitative Comparative Analysis methodology,” Paper for the *79th Annual Meeting of the Academy of Management*, Boston, USA, 9-13 August 2019.
- Kelvin W. Willoughby & Nadezhda Mullina, “Global Innovation, Outbound International Patenting and Emerging Countries,” Paper for the *R&D Management Conference 2019*, Research and Development Management Association, École Polytechnique and HEC Paris, Paris, France, 17-21 June 2019.
- Georgy Klushin, “Between Modularity, Imitation and Intellectual Property: The Role of Patent Protection, A Review,” *Proceedings of the International Conference on Industrial Engineering and Operations Management*, Pilsen, Czech Republic, July 23-26, 2019.
- Kelvin W. Willoughby, “Gifted Education, Scientific Research and Technological Innovation: The Philosophy and Practice of Skoltech,” in *The 1st Thai-Russian Roundtable (TRRT): Collaboration on Gifted Education and Research* (Bangkok: Office of the Education Council, Kingdom of Thailand, 2018) pages 57-66.
- Anja Tekic & Kelvin W. Willoughby, “Construing the conceptual mess around co-creation: An Innovation Management Perspective,” Paper for the *24th Innovation and Product Development Management Conference (IPDMC)*, Reykjavik University, Iceland, 11-13 June 2017.
- Anja Tekic & Kelvin W. Willoughby, “Co-creation and open innovation: Related but distinct concepts in innovation management,” Paper for the *R&D Management Conference 2016* From

Science to Society: Innovation and Value Creation, Cambridge University, United Kingdom, 3-6 July 2016.

- Anja Tekic & Kelvin W. Willoughby, “The strategic coupling of intellectual property management and co-creation,” Paper for the *15th International Open and User Innovation Conference*, University of Innsbruck, Innsbruck, Austria, 10-12 July 2017.
- Anja Tekic & Kelvin W. Willoughby, “The strategic coupling of intellectual property management and co-creation strategies,” Paper for the *23rd Innovation and Product Development Management Conference*, Glasgow, United Kingdom, 12-14 June 2016.
- Kelvin W. Willoughby, “What impact does intellectual property have on the business performance of technology firms?” *INFORMS (Institute for Operations Research and the Management Sciences) 2014 Annual Meeting*, San Francisco, California, November 8-12, 2014.
- A. Ivanov & Z. Tekic, “Using Contextual Data for Smart Patent Analysis,” *Proceedings of the 8th IEEE International Conference on Cloud Computing Technology and Science*, Luxembourg, 12-15 December 2016, pp. 448-451.
- A. Ivanov & Z. Tekic, “Towards Smart Patent Analytics - Matching Patent and Contextual Data,” R&D Management Conference, 2016 *From Science to Society: Innovation and Value Creation*, Cambridge University, United Kingdom, 3-6 July 2016.
- M. Malyy and Z. Tekic, “Role of Startup’s Intellectual Property in VCs Investment Decision-Making: Evidence from Russia,” Paper for the *2018 IEEE International Symposium on Innovation and Entrepreneurship (TEMS-ISIE)*, Beijing, China, 2018.
- M. Malyy and Z. Tekic, “The role of universities in Russian startup ecosystem,” *Proceedings of the 1st Regional Conference on Entrepreneurship and Open Innovation in University - Industry Collaboration*, University of Novi Sad, Serbia, 20-23 September 2016, Eds. Z. Tekic Z. and P. Vrgovic (iDEALab Conference 2016), pp. 73-79.
- E. Kotenko Lengold & K. W. Willoughby, “Intellectual Property Protection of Satellite Data: Problems, Opportunities and Impact on Innovative Development of the Remote Sensing Market,” Working Paper, (unpublished) in progress, January 2017.
- D. Satikova & K. W. Willoughby, “The protection of personal data in the context of cross-border data transfer and cloud computing: Global trends,” Working Paper (unpublished), in progress, January 2017.

Recent Invited Lectures of Members of Skoltech’s the *INIP Lab*

- Kelvin W. Willoughby, Invited speaker, International Conference, *Intellectual Rights: Challenges of the 21st Century*, Tomsk State University, National Research University, Tomsk, Russia, 14-16 November 2019. Topic: “Endogenous Innovation, Outward-bound International Patenting and National Economic Development”
- Kelvin W. Willoughby, Invited speaker, International Conference, *Intellectual Rights: Challenges of the 21st Century*, Tomsk State University, National Research University, Tomsk, Russia, 14-16 November 2019. Topic: “What Can Be Patented? Technological Innovation and the Contemporary Mess in Patent Law”
- Kelvin W. Willoughby, Invited speaker, *Skolkovo IP Academy (IP Академия Сколково)*, Technopark, Skolkovo, Moscow, Russia, 18-20 September 2019. Master Class. Topic: “Universities, Intellectual Property and Global Technological Innovation”
- Kelvin W. Willoughby, Invited speaker, *National Science and Technology Agency*, Kingdom of Thailand, Thailand Science Park, Bangkok, 21 January 2019. Topic: “Fostering Linkages Between Research and Education with Innovation and Entrepreneurship”

- Kelvin W. Willoughby, Invited speaker, *Skolkovo Patent School* (Патентная Школа Сколково), Technopark, Skolkovo, Moscow, Russia, 1-2 November 2018. Seminar on Best Practice in Managing Intellectual Property in Universities and Institutes. Topic: “Raking Leaves in the Wind: Managing University IP in Turbulent Times”
- Kelvin W. Willoughby, Keynote speaker, *International Conference on Business and Sustainable Development* (JCBSD 2018), University of Rajshahi, Rajshahi, Bangladesh, 8-9 March 2018. Topic: “Endogenous Innovation, Outward-bound International Patenting and National Economic Development: What is Happening in Asia?”
- Kelvin W. Willoughby, Keynote speaker, *China Intellectual Property Conference*, Nanjing University of Science and Technology, College of Intellectual Property, Nanjing, China, 15-16 December 2017. Topic: “Endogenous Innovation, Outward-bound International Patenting and National Economic Development: China and the World”
- Kelvin W. Willoughby, Keynote speaker, *28th DAAAM International Symposium, Intelligent Manufacturing and Automation*, DAAAM International Vienna, Technical University of Vienna & University of Zadar, Croatia, 8-11 November 2017. Topic: “What is Technology?”
- Kelvin W. Willoughby, Invited speaker, *National Innovation Agency, Royal Government of Thailand*, Bangkok, 24 January 2017. Topic: “Intellectual Property Management for Entrepreneurs.”
- Kelvin W. Willoughby, “Problems and Prospects for Patent-Eligible Subject Matter in European and United States Patent Law,” *25th Annual Fordham Intellectual Property Law & Policy Conference*, Fordham University Law School, New York City, April 2017.
- Kelvin W. Willoughby, Keynote speaker, *7th International Conference on Mass Customization and Personalization in Central Europe* (MCP-CE 2016) and the *1st Regional Conference on Entrepreneurship and Open Innovation* (IDEALab 2016), University of Novi Sad, Novi Sad, Serbia, 20-23 September 2016. Topic: “Open Innovation and Intellectual Property.”
- Kelvin W. Willoughby, Invited speaker, *Intellectual Property Management Teaching Workshop, University of Cambridge & Chalmers University*; Sponsored by EITIM (European Institute for Technology and Innovation Management), EPO (European Patent Office), UKIPO (U.K. Intellectual Property Office), and WIPO (World Intellectual Property Organization), 16 September 2016. Topic: “Technology Licensing Games and IP Management Education.”
- Kelvin W. Willoughby, Invited speaker, *Rajiv Gandhi School of Intellectual Property Law, Indian Institute of Technology, Kharagpur, India*, 19 May 2016. Topic: “Contemporary Issues in the Law of Patent-eligible Subject Matter in the United States and Europe.”
- Kelvin W. Willoughby, Invited speaker, *Rajendra Mishra School of Engineering Entrepreneurship, Indian Institute of Technology, Kharagpur, India*, 18 May 2016. Topic: “Financing Technology Entrepreneurship.”
- K. W. Willoughby, Keynote speaker, *Startup Village 2015*, Skolkovo Innovation Center, Annual Conference organized by Skolkovo Foundation, Moscow, Russia, 2 June 2015. Topic: “Why is the Subject of Intellectual Property Important for Startups?”
- Kelvin W. Willoughby, “Intellectual Property and Open Innovation: Friends or Foes?” Paper from Invited Lecture, *12th Annual Triple Helix International Conference*, Tomsk, Russia, 11-13 September 2014.
- Kelvin W. Willoughby, “The Rise of Regional Bioscience-Technology Industries in the United States” Paper from Invited Lecture, *12th Annual Triple Helix International Conference*, Tomsk, Russia, 11-13 September 2014.

Educational Courses Associated with the *Innovation and Intellectual Property Laboratory*

Ph.D. Courses

- *Intellectual Property, Technological Innovation and Academic Research* DC060006 [6 credits]
- *Technology Commercialization: Foundations for Doctoral Researchers* DC060002 [6 credits]
- *Innovation and Intellectual Property Studies Doctoral Seminar* DC060009 [6 credits]
- *Philosophy of Science, Technology and Innovation* PE06026k [6 credits]

Masters Courses

- *Intellectual Property and Technological Innovation* MC060006 [6 credits]
- *Ideas to Impact: Foundations for Commercializing Technological Advances* MC060002 [6 credits]
- *Technology Entrepreneurship* MC060008 [6 credits]

Ph.D. Program in Innovation and Intellectual Property Management

- Contact Prof. Willoughby at kelvin@skoltech.ru for details

Practical Services Offered by Members of the *Innovation and Intellectual Property Laboratory*

- *IP Analytics* - Training in the use of IP data and IP-related data and analytical services for research planning and innovation support. Various members of the *INIP Lab*
- *IP Training* - Customized seminars, training and executive education related to intellectual property and innovation. Various members of the *INIP Lab*

Innovation and Intellectual Property Laboratory (INIP Lab)

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