Essay written by Peter Rieder, BA, BA, BEc.

31 July 2015

EDUCATION

Universität Innsbruck is the finest university

Impeccable scholarship and research

Universität Innsbruck (University of Innsbruck) is a distinguished university with an impeccable academic heritage. Excellent research continues to be the main factor governing the university. It concentrates on five disciplines to maintain a strong commitment to development and innovation. Collaboration between scholars and entrepreneurs yields successful joint projects. Several university projects became global corporations. Twelve significant Innsbruck scholars are celebrated for contributing to scholarship. The Institut für Experimentalphysik is the epitome of advanced research and innovation.

The University of Innsbruck is the oldest and most significant university in western Austria. The Holy Roman emperor Leopold I established the university on 15 October 1669. He guaranteed finance for the university with the introduction of the Sondersteuer auf das Haller Salz (Haller Salt Surcharge). The extraordinary tax imposed on the extraction of salt from the town of Hall in Tirol. The university comprises sixteen faculties and seventy-nine institutes providing a deep and broad education in all academic disciplines. 33,891 undergraduate and graduate students attended the university in the 2014/2015 winter semester. 4,574 scholars and staff were employed in 2014. 3994 undergraduate, graduate and doctoral degrees were awarded in 2013/2014.

Research is an integral factor contributing to the success of the university. Innsbruck established five significant research disciplines, four research platforms and thirty-seven research centres. Alpine space encompasses academics at seven faculties studying the impact of human behaviour on the alpine ecosystem. Research attempts to develop sustainable solutions to preserve the alpine environment. Physics provides the foundation for understanding the natural world and technological innovation. Innsbruck physicists built many international networks in astrophysics, quantum physics, astroparticle physics and applied physics. Computer science is applied to answer scientific questions. Sophisticated mathemathical techniques and models are used in 30 research areas and 4 interdisciplinary research platforms. The Centre for molecular sciences examines the structure, function and interaction of biological macromolecules. The study is important for understanding cell growth, metabolic development and activity. Cross encounters-cultural conflict has a long tradition at the university. It examines the significance of cultural encounters and conflict influencing humanity.

The university encourages entrepreuneurship. It has invested in the transfer of knowledge and technology to promote the university's innovative products and services. Transidee is a transfer centre encouraging collaboration between scholars and Austrian and international entrepreneurs. The University of Innsbruck, Management Center Innsbruck and Tiroler Zukunftsstiftung (Tyrolean Future Foundation) are partners in Transidee. The centre is crucial in the implementation of successful joint projects involving applied research. Numerous small and medium size companies enjoy successful joint projects.

Applied research has resulted in the establishment of several prominent corporations. MED-EL is an Austrian technology corporation dominating global development and manufacturing of implantable hearing systems. Dr Ingeborg Hochmair established the corporation in 1990. The enterprise manages more than 1,500 employees. Ionicon Analytik was established in 1998. The Austrian corporation is the global leader in producing proton transfer reaction mass spectrometry technology. The corporation manages 30 employees. Intales GmbH was established in 2004. It provides a range of structural analyses for the aerospace industry. Corporate expertise concentrates on analysing nonlinear complex lightweight structures. The enterprise is located in the Tyrolean village of Natters.

Innsbruck celebrates twelve significant academics for their contribution to scholarship. Eugen Ritter von Böhm-Bawerk (1851-1914) contributed to the Austrian School of Economics. He published *Kapital und Kapitalzins (Capital and Interest)* providing the foundation for political economic theory in the late 19th century. He was the Austrian finance minister on three occasions. Bruno Sander (1884-1979) wrote the thesis *Über Zusammenhänge zwischen Teilbewegung und Gefüge in Gesteinen (On relationships between partial movement and structure in rocks*) in 1911. It provided the foundation for plate tectonics. His underflow hypothesis influenced Alfred Wegener's continental drift theory. Arthur March (1891-1957) was a Tyrolean physicist renowned for studying radiation and quantum mechanics. He published *Theorie der Strahlung und der Quanten (The theory of Radiation and Quantum)* in 1919. Anton Kerner Ritter von Marilaun (1831-1898) established modern analytical causal phytogeography. He was the Erstinhaber Botanical professor at the university between 1860 and 1878. Erika Cremer (1900-1996) was a distinguished chemist. She developed gas chromatography at Innsbruck in 1944.

Natural scientists constitute a large proportion of the twelve important Innsbruck scholars. Karl Heider (1856-1936) taught zoology at the university. A pioneer in genetics and biology. His most important contribution was developing physiology and the evolution of invertebrates. Wilhem Wirtinger (1865-1945) developed mathematical formulae for Ludwig Boltzmann's physical theories. His success resulted in the University of Vienna luring him to Vienna. Egon Schweidler (1873-1948) was instrumental in developing statistics for radioactive decay. Schweidler and Stefan Meyer wrote the *Handbuch der Radioaktivität* (*The Handbook of Radioactivity*) in 1916. It remains an important text. Heinrich Ficker (1881-1957) was a pioneer in stratospheric meteorology. His 1906 dissertation *Innsbrucker Föhnstudien* established the foundation for meteorology. Victor Franz Hess (1883-1964) was appointed the executive of the Institut für Strahlenforschung (Institute of Radiation) in 1931. The laboratory examined cosmic

rays and the effects of increasing ionisation due to an increase in altitude. He received the Nobel Prize for Physics in 1936 for discovering cosmic rays.

Arts and humanities academics are recognised in the twelve important scholars. Julius von Ficker Ritter von Feldhaus (1826-1902) established the Innsbrucker Historischen Schule (Innsbruck Historical School). It was influential throughout Austria and Germany. He was appointed to the university in 1852. His contribution to diplomatic theory, medieval history and the history of law are comparable to Leopold Ranke and Johann Gustav Droysen. Heinrich Lammasch (1853-1920) was a member of the Hague Arbitration Tribunal and opposed the Austrian Empire participating in the First World War. He is considered the pioneer of the Austrian foreign policy of neutrality.

Advanced experimental research is conducted at the Institut für Experimentalphysik (Institute for Experimental Physics). The faculty was established in 1742 with the creation of an armarium of instruments to conduct physical experiments. The research incorporates quantum information, quantum optics, spectrometry, quantum gases, cold atoms, photonics, solid state physics and superconducting quantum circuits. The faculty has been responsible for numerous discoveries and developments. Creating an improved interface for a quantum internet is recent research conducted by the faculty. The research was published in January 2015. Rainer Blatt's team placed two particles between highly reflective mirrors. A laser was used to entangle the particles. Additional lasers were implemented to encode quantum information in the ions and transfer the information to a single photon. A quantum computer would benefit from information stored as ions and retrieved as photons.

Christian Doppler Laboratories are used by Innsbruck scholars. Christian Doppler Forschungsgesellschaft (Christian Doppler Research Association) provides laboratories to Austrian universities to encourage collaboration between exceptional scientific scholarship and the corporate world. Scholars at the Institut für Mechatronik (Institute for Mechatronics) conduct research using a laboratory for active implantable systems. Another laboratory conducts research for cement and concrete technology. Schretter und Cie GmbH und Co KG, Doka GmbH and Rieder Smart Elements GmbH are corporate partners for the concrete technology laboratory. The Christian Doppler Laboratory for Textile and Fibre Chemistry in Cellulosics between 2002 and 2008 identified structural parameters of fibres during the textile process, synthesis of chemically modified cellulosic fibres and textiles, medical applications of fibres and microbial properties of fibres and textiles. Corporate partners and the Univeristy of Innsbruck conducted the complex research using advanced scientific techniques.

Universität Innsbruck is the finest university with an excellent academic heritage. The five disciplines of alpine space, physics, computer science, molecular sciences and cross encounters-cultural conflict provide the foundation for innovation and excellent scholarship. Endorsing enterprise is a vital nexus between research and innovative corporations. Applied research has resulted in the creation of global corporate leaders. The university celebrates twelve exceptional scholars. The scholars contributed to the university and scholarship. The Institut für Experimentalphysik is a distinguished faculty providing technological innovation and solutions.