

# Curriculum Vitae



## Dr. Karin Markides

Professor and President Emerita

### Academic Leadership Experience

#### **American University of Armenia**

*President, July 2019 -*

#### **Chalmers University of Technology**

*President and Chief Executive Officer, 2006 – 2015*

*Senior Advisor to the President, 2015 – 2016*

Through trust building methodology, I was leading the growth and transformation of Chalmers into a 21<sup>st</sup> century university. Traditionally isolated disciplines were strengthened and integrated using dynamic virtual environments, information technology and advanced infrastructure. Education, research, innovation and collaboration were enhanced by incentives supporting excellence, innovative teaching, transdisciplinary research, novel fundraising tools and an effective yearly planning process. Students, researchers, staff, collaborators and alumni were devised with working procedures and tools to enhance inclusion, leadership, growth, transformation and impact. The resulting enhanced funding to Chalmers where I, as President, played a central role, included: *Chalmers Ventures*, leader in academic innovation and entrepreneurship, *Graphene Flagship*, 1 billion Euro (Chalmers coordinate partners in 24 countries); *Multi cross-cut cooperation* with 10+ industries, 100 million SEK per year; *AstaZero* transport safety research Infrastructure, 500 million SEK + 100 million SEK per year; *Mistra Urban Futures* transdisciplinary global center, 500 million SEK; *HSB Living lab* reality-based infrastructure, 70 million SEK; and a 40% increase in public *basic funding*. In addition, a yearly addition of several *new buildings* could be funded with highest environmental standard for research, education, innovation, student housing and social activities.

#### **The Swedish Scientific Council for Sustainable Development**

*Developmental Leader and Chairman, 2015 – 2019*

I am leading and developing the first Scientific Advisory Council for the government of Sweden. With twelve leading scientists of diverse faculties, a scientific base and a systemic view is provided of complex challenges facing Sweden and the world. The knowledge is presented in ways that builds understanding, trust and an action framework for responsible politicians and government officials. The goal is to develop a respected academic sounding board for integrated social, economic and ecologic decision making, based on integration, transformation and universality, for growth in the 21<sup>st</sup> century.

#### **University of Stockholm**

*Developmental Leader, 2018*

Assigned by the President of the university of Stockholm to restructure the organization and strategic process (based on the sections of Chemistry and Geosciences) integrating excellence and relevance to meet the challenges of the 21<sup>st</sup> century where circular system thinking become more of a driver in our society.

## **Uppsala University, Faculty of Science and Technology, Sweden**

*Dean of Chemistry and Chemical Engineering, 1996 – 2002*

*Professor Emeriti of Chemistry, 2018-present*

I directed education, student life, research excellence and community outreach in chemistry at the largest public university in Sweden. I represented the voices of chemistry and chemical engineering faculty, students and staff within the university organization; led the relocation, construction and growth of facilities and academic operations, renewed an integrated undergraduate curriculum; enhanced collaboration across disciplines; broadened the role of leading-edge chemistry research in medicine, mathematics, physics and pharmacology; and established an innovation office with experienced coaches that soon became a university-wide office.

## **CESAER (Conference of European Schools for Advanced Engineering Education and Research)**

*President 2009 – 2011, active past president 2012-2013*

I had a leading role representing and coordinating the top 50 universities (with strong technology faculty) in Europe to become the main European point of reference guiding the framework program Horizon 2020 for scientific excellence and ethics in engineering education and research. This included novel policies aiming to promote innovation through academic led cooperation with industry and society for supporting long-term sustainable societal development and economic growth.

## **Alliance for Global Sustainability**

*Chairman, 2007 and 2010*

*Coaching team-leader, 2006 –2014*

Based on a donation, the goal was to enhance leading universities contribution towards sustainable development. I led the main node for this collaboration between Chalmers, MIT, Tokyo and ETH, and their associated partners in academia, industry and society. The network enabled transformational development through a yearly large conference of shared progress and challenges, where leaders from all stakeholder groups inspired and informed each other on trends and possibilities.

## **Nordic5Tech**

*Board Member (circulating chair), 2007 – 2015*

I was an initiator and later one of the leaders developing this alliance to support diversity and mobility by collaboration around educational tracks. The network connected leading Nordic universities of technology, i.e., Chalmers, KTH, Trondheim, Aalto and DTU.

## **IDEA League**

*Board Member, 2013 – 2015*

The positive development at Chalmers resulted in an invitation to Chalmers to join the focused network designed to strengthen leading European Universities of Science and Technology (Imperial college, university of Delft, ETH, and university of Aachen). My contribution, with Chalmers researchers, became instrumental in developing novel collaborative instruments and processes enhancing excellence and impact especially in research collaboration.

## **University governance coaching**

- Strategic evaluator of governing profile areas of Luleå University, 2016
- Strategic team evaluator with reconstruction of Chemistry at Umeå University, 2006
- Strategic evaluator of new profile at Malmö University, 2017

## **Academic Societal Impact Experience**

### **Royal Swedish Academy of Science, KVA**

*Elected Member, 1999 – life*

Class for Chemistry – selects the Nobel Prize in Chemistry  
Fosters science for society, schools and scientific community.

### **Royal Swedish Academy of Engineering Science, IVA**

*Elected Member, 1992 - life*

Class of Chemical Engineering

*Vice Preses for IVA, 2005 – 2007*

Fosters science-technology-industry-society interaction for dissemination, development and impact.

### **Molecular Frontiers**

*Mentor and Board member, 2010 – present*

*Chairman, 2017-present*

Foster development of a network for systemic improvement of scientific knowledge in the next generation through direct and indirect inspiration by Nobel Prize laureates and other leading scientists. Molecular Frontiers include a digital platform attracting young children and a most attractive yearly conferences for high-school students (arranged at leading universities in Singapore, USA, Korea, Japan and Sweden) with special support from the Royal Swedish Academy of Science, Massachusetts Institute of Technology, European Science Foundation and Chalmers. During 2018, a number of universities in the USA, Asia and Europe are developing partnership with Molecular Frontiers.

### **Pedagogic National Project “Find the Chemistry”**

*Chairman, 2017 – present*

From the Royal Academy of Engineering Science and the Royal Academy of Science, and in collaboration with Science Centers of Sweden, I lead the development of a novel concept educating children and teachers in chemistry through curiosity attraction starting from complex realities in society and by using virtual reality tools and illustrations.

### **The Swedish Knowledge Foundation**

*Board Member, 2016 – present*

I have a strong influence on enhancing the ability of this major research grantor to provide incentives to public colleges and younger universities. These incentives include digitalization, dual mission of academic and professional learning, regional development, and to attract and retain excellence, create value and show impact.

### **Swedish Foundation for Strategic Research, SSF**

*Board Member 2000 - 2005*

*Chairman for the call on Materials for Energy 2017*

*Chairman of the program Future Scientific Research Leaders 2017 - present*

I am, and have been active and influential in different capacities of improved incentives for diversity, inclusion, leadership, generic skills and system thinking in this research foundations portfolio and active programs.

### **Universeum Science Centre, Göteborg, Sweden**

*Foundation Board Member, 2008 – 2015*

*Acting Chairman, 2010-2011*

I provided guidance for both goal and strategic process, and how to integrate output and activities at the Science Centre with research and education at Chalmers. As Chairman, I helped the organization through a time of internal crisis of cultural clash.

### **Evaluator of Institutions and Research Proposals**

- Leading the international evaluation committee of the Finish Government Initiative for Research Excellence, 2016
- International evaluator of RIKEN research institute, Japan, 2009
- International strategic coaching of Luleå University of Technology, 2000 - 2004

- International strategic evaluator of SFI, Ireland, 2004 - 2005
- Frequent evaluator for NFR, VR, STINT, Norway NFR, Finland NFR, USA NSF, USA DOE, VINNOVA, and EU framework programs

## Teaching and Leadership Development Experience

### **The 6<sup>th</sup> Scientific Leadership Programme of the Foundation of Strategic Research**

*Designer and leader, 2017 – present*

I am leading and developing the leadership training of a group of 20 selected young scientists that won grants as Future Research Leaders in Sweden. The training include developmental leadership for excellence, transformation and scaling with local and international impact.

### **Unitech International**

*President 2011 – 2015*

*Honorary Alumnus 2015 – present*

I led the development of this leadership program, where students are trained to become systemic leaders for disruptive and sustainable development needed in society. The master's program involves twenty corporate partners, eight academic partners and over one thousand alumni who continuously expand a network of professional agile leaders for the 21st century. This program attracts leadership talent from underrepresented student populations.

### **Teaching Chemistry and Chemical Engineering**

*Teaching courses on all levels of higher education 1978-2004*

### **Supervisor**

*Supervisor for research laboratory with over 20 PhD and postdoc, Brigham Young University, 1986-1989*

*Supervisor for 35 graduate PhD students, Uppsala University, 1989-2005*

### **Mentor**

*Mentor in the program SSF Future Research Leaders, FFL-2, 2005 – 2010*

*Mentor in the program Wallenberg Academy Fellows, 2012 – 2016*

## Academic Research Infrastructure and Innovation System Experience

### **The Scientific Advisory Board for Research Infrastructures ESS/Max IV**

*Chairman of the Board, 2015 – 2019*

I lead the development and implementation of a strategy for Sweden how to act as a host of a world-leading twin research infrastructure, that will become the most advanced neutron beam for science and the brightest source of x-ray world-wide. The focus is on fostering an integrated knowledge environment for academia, business and society.

### **Johanneberg Science Park AB, Göteborg, Sweden**

*Board Member, 2009 – 2012*

*Chairman of the Board, 2014 – 2016*

I actively implemented the role of academia in this novel type of Science Park as a campus-based non-profit meeting place, co-owned by public-private-academia partnerships. It included fostering of transformative and challenge-driven development and digitalization in the built environment, materials and energy area.

### **Lindholmen Science Park AB, Göteborg, Sweden**

*Board Member, 2006 – 2012, 2014*

Participated and mentored the development of a campus-based non-profit meeting place with focus on IT, visualization and transportation.

### **VINNOVA, State Agency for Innovation Systems, Sweden**

*Deputy Director General, 2004 – 2006*

I developed an open knowledge and innovation eco-system culture and defined the role of academia in this dynamic meeting place.

### **Chalmers Innovation Foundation, Business Incubator**

*Board Member, 2008 – 2013*

I was instrumental in modernizing the role and organization of this incubator, and making it a core in a new consolidated innovation ecosystem company *Venture Creation* at Chalmers

### **Swedish Research Council VR, Committee for Research Infrastructure, KFI**

*Board Member, 2004 - 2006*

*Chairman of the Board for Earth and Its Environment, 2005 - 2006*

I provided strong influence for a modernized view on research infrastructures as meeting places for transformative development, open to all disciplines and actors secured by a university governance network.

### **The Swedish Government Globalization Council**

*Member, 2007 – 2009*

I provided input from the academic perspective in this high-level council consisting of leaders from all parts of society.

### **Scientific Advisor Uppsala University Innovation Office**

*Scientific leader and advisor, 1998 – 2005*

I enabled the first grant to start and build this on-campus innovation office and activities.

### **IMSS, International Mass Spectrometry Society**

*Board Member 2000 - 2006*

*Chairman of the Swedish Mass Spectrometry Society, 1998 - 2006*

My contribution was to modernize the organization, and make it cross-disciplinary driven by excellence in basic science and technology inspired by transdisciplinary challenges. I also connected it to the international society.

## **Professional Board Experience**

### **Einride AB**

*Board Member, 2018 – present*

I act as an experienced mentor and director in this knowledge intense start-up company, founded by Chalmers student alumni, for disruptive road transport solution, based on T-pod with self-driving electric propulsion.

### **Perstorp Holding AB**

*Board Member, 2010 – present*

My role is non-executive leadership of Perstorp, a world leader in several sectors of the specialty chemicals market for a wide variety of industries and applications. I have focus on facilitating understanding of barriers to implement knowledge transfer between academia and business, and developed strategies and goals to enable sustainable knowledge transfer for future development and competitiveness.

## **Swedish Industries Research Council**

*Board Member, 2013 – 2017*

I served as an academic expert to industrial leaders regarding the value of education and research in industry at all levels, and how to effectively incorporate these in industrial development. This included resolving difficulties encountered in communication between university and businesses, and ensure mutual benefit.

## **Technical Research Institute of Sweden AB, SP**

*Board Member, 2006 – 2015*

I provided a perspective of innovation ecosystem rather than linear innovation process, and was instrumental in the co-creation of the full-scale research and test-arena in transport safety, Asta Zero, between Chalmers and SP.

## **High Level Group: Competitiveness of Chemical Industry, DG**

### **Enterprise EU, Brussels**

*Member representing Nordic Chemical Industries and Academia, 2007-2009*

As the only representative from academia, I provided input that came to be central for the outcome on turning the branch from deep crisis to become the enabling industry for circular economy and sustainable business.

## **Scientific Advisory Board Member**

- Sensar Corporation (academic startup), Orem, UT, USA, 1992 - 1995
- MDS Sciex (large scientific instrument company), Toronto, Canada, 1996 - 1998
- Biospect (academic startup), San Francisco, CA, USA, 2002 - 2003
- Tao (SME-biomedical company), Oakland, CA, USA, 2000 - 2002

## **Honors, Awards and Distinctions**

Chalmers Medal in silver, Sweden	2017
Gothenburg City Badge of Merit, Sweden	2015
Oscar Carlson Quinquennial Medal in silver, Sweden	2010
H.M. King of Sweden 12 <sup>th</sup> size gold medal on Seraphim Order ribbon	2008
Royal Swedish Academy of Eng. Science Gold Jeton	2007
International Scientist of the Year, Pittsburgh, USA	2004
SFC outstanding Scientist, USA	2001
Senior Individual Grant, SSF	1997
Jubilee Medal in Chemistry, Great Britain	1992
Norblad-Ekstrand Medal, Sweden	1990

## **Own Academic Career**

### **Uppsala University, Department of Analytical Chemistry, Sweden**

*Chair Professor of Analytical Chemistry, 1989 – 2004*

I led the Department of Analytical Chemistry at the largest public university in Sweden, and developed a thriving and leading education and research environment for both basic and applied science.

### **Stanford University, Chemistry Department, USA**

*Visiting Professor, 2003 – 2004*

Together with Professor Dick Zare and the Wallenberg foundation, we developed international researcher-to-researcher and student-to-student cooperative relationships between the two universities.

### **Brigham Young University, Chemistry Department, USA**

*Post-Doctoral Fellow, June 1984 – 1985*

*Assistant Research Professor, 1985 – 1989*

*Associate Research Professor, 1989 – 1990*

I directed the day-to-day research activities of approximately 20 graduate students, postdoctoral researchers and guest scientists, while conducting my own research projects. These activities involved creativity, organization, and skills in interpersonal relations, business collaboration and cross-disciplinary research.

### **University of Stockholm, Chemistry Department, Sweden**

*Laboratory Director, 1975-1979*

I directed operations and prepared reports for a university-based pesticide control laboratory for fruits imported into Sweden while pursuing my higher education in chemistry.

## **Education and Credentials**

### **Uppsala University, Sweden**

*Chair professor (appointed for life) of Analytical Chemistry Science and Engineering, 1989*

### **Brigham Young University, USA**

*Research Professor in Chemistry, 1989*

### **University of Stockholm, Sweden**

*Docent in Analytical Chemistry, 1986*

*PhD Analytical Chemistry, 1984 with the title “Organosiloxanes Containing Cyano Groups for Capillary Chromatography”, ISBN 91-7146-297*

*M.S. Chemistry, 1975*

*B.S. Mathematics, Geology, Geography, 1973*

## **Major Own Research Grants**

*1989 – 2004, Grants and funding with me as sole PI (numerous collaborative grants in applied sciences are not listed here)*

### **National Science Foundation of Sweden**

Basic science grant, awarded continuously in three year cycles 1989-2005 of 3 million SEK per year, and in addition a research equipment grant, 5 million SEK

### **K&W Wallenberg Foundation**

Research equipment, 100 million SEK

Innovation ecosystem at Uppsala University, 5 million SEK

Collaboration with Stanford university, 2 million SEK

### **Swedish Strategic Foundation**

Senior Individual Grant, 25 million SEK

### **European Union**

Marie Curie Research Laboratory, 10 million SEK

### **1998-2004, External Funding from Industry**

Sciex, Hewlett Packard, Astra Zeneca, Sandoz, Hoffmann LaRoche, Pharmacia, General Electric, supporting equipment, operational cost, graduate students, postdocs

## Patents

1. "Novel Liquid Crystalline Compounds and Polymers," J.S. Bradshaw, M.L. Lee, K.E. Markides, and B.A. Jones. US Patent Number 4,864,033. Filed: November 27, 1985. Issued: February 1989.
2. "Multi-Element Selective Radio Frequency Plasma Detector for Capillary Gas Chromatography, F. Yang, P. Farnsworth, R. Skelton, K.E. Markides, and M.L. Lee. U.S. Patent Application Serial No. 24,095. Filed: March 12, 1987. Issued: January 25, 1989.
3. "Oligoethylene Oxide Substituted Siloxane Compounds and Polymers," J.S. Bradshaw, M.L. Lee, K.E. Markides, Filed: December, 1987.
4. "Chiral Polysiloxane Compounds and Polymers," J.S. Bradshaw, M.L. Lee, K.E. Markides, Filed: January, 1988. Issued: June 1990.
5. "Chromatographic Arylcarboxamide Polysiloxanes," J.S. Bradshaw, M.L. Lee, K.E. Markides, Filed: June, 1988. Issued: March 1990.
6. "Novel Chiral Copolymers with Oligosiloxane Spacers," J.S. Bradshaw, B.E. Rossiter, B.J. Tarbet, D.F. Johnson, M.L. Lee, K.E. Markides, File No. 9393 CIP. Filed: March 1992.
7. "Encapsulated Nanoparticles for Drug Delivery", G. Jacobson, R.N. Zare, K.E. Markides, R.R. Shinde and C.H. Contag, File No. 11/748,408, Filed: May 14, 2007.

## Publications and Presentations

*Published peer-reviewed articles: 290*

*Scientific and public presentations: over 500*

1. L. Blomberg, K. Markides and T. Wännman, "Modification of Glass Capillary Columns by Cyclic (3,3,3-trifluoropropyl) methylsiloxanes," HRC&CC, 527, (1980).
2. L. Blomberg, J. Buijten, K. Markides and T. Wännman, "Peroxide-Initiated In Situ Curing of some Silicone Gums for Capillary Columns," HRC&CC, 4, 578 (1981).
3. L. Blomberg, K. Markides and T. Wännman, "Glass Capillary Columns for Gas Chromatography Coated with Non-Extractable Films of Cyanosilicone Rubbers," J. Chromatography, 203, 217-226 (1981).
4. L. Blomberg, K. Markides and T. Wännman in R.E. Kaiser (editor) "Cyclic Siloxanes for Chemical Modification of Glass Capillaries for Gas Chromatography." Pro-ceedings of the Fourth International Symposium on Capillary Chromatography, Hindelang IV, Huthig, Heidelberg, 1981, p. 73-89.
5. L. Blomberg, J. Buijten, K. Markides and T. Wännman, "Evaluation of Bonded Methylsilicone Rubber as a Stationary Phase for Glass Capillary Columns," J. Chromatogr., 208, 231-238 (1981).
6. L. Blomberg, J. Buijten, K. Markides and T. Wännman, "Peroxide-Initiated in Situ Curing of Silicone Gums for Capillary Column Gas Chromatography," J. Chromatogr., 239, 51 (1982).
7. J. Buijten, L. Blomberg, K. Markides and T. Wännman, "Preparation of Capillary Columns Coated with Phenylsilicone Gum," J. Chromatogr., 237, 465-468 (1982).
8. J. Buijten, L. Blomberg, K. Markides and T. Wännman, "Crosslinked Methyl-phenylsilicones as Stationary Phases for Capillary Gas Chromatography." Chromatographia, 16, 183-187 (1982).