

## Kari Gustav Henrik Heiskanen

First names Kari Gustav Henrik  
Last name Heiskanen  
Nationality Finnish  
Year of birth 1946  
Marital status Married



### Education

#### Doctor of Science in Engineering, 1979

• Helsinki University of Technology; major subject: Mineral processing; minor subject; Control Engineering

Dissertation "On the estimation of system parameters in mathematical simulation of batch grinding"

#### Licentiate of Science in Engineering, 1974

• Helsinki University of Technology; major subject: Mineral processing; minor subject; Control Engineering

Lic thesis: "Use of population balance models for energy estimation in comminution"

#### Master of Science in Engineering, 1971

• Helsinki University of Technology; major subject: Mineral processing; minor subject; Mining Engineering

Master thesis: "Flotation behavior of Co-pentlandite at Luikonlahti concentrator"

### Expertise

Mineral processing; flotation, flotation hydrodynamics, modeling; comminution; multi-phase flows; sampling; particle technology.

### Language skills

Finnish	Native language
Swedish	Second native language
English	Fluent
Spanish	Good
German	Medium
French	Basic

## PROFESSIONAL CAREER

2020-present	Metso:Outotec/ Minerals BA; • Technology Director; R&D
2014-2020	Outotec/ Mineral Processing BU; • Technology Director; R&D;
1985-2014	Aalto University/Helsinki University of Technology/ •Chair in Mineral processing; Full Professor (tenured) Dean 1998-2007
1980-1985	Larox Oy/ classification and concentration div. • Division Manager.; member of Larox Exec. Board
1979-1980	Outokumpu Oy Engineering • Project Manager
1976-1979	Outokumpu Oy/ Mine Technical Group • Research Engineer
1973-1976	Helsinki University of Technology (Outokumpu Foundation) • Doctoral Student
1970-1973	Outokumpu Oy/ Vuonos Mine • Project Engineer, Ass. Mill Supt.

## RELEVANT PROJECT EXPERIENCE

1983-4	Scantec SA, Peru, Sayapullo Mine Technical director; Member of Board Mine and mill design (Cu, Zn, Ag)
1982-3	Inversiones Mineras SA, Peru, Santa Maria Mine Technical director; Member of Board Mine and mill design (Cu, Au)
1979-80	Etibank; Küre •Cu beneficiation plant; Project manager Plant design and procurement
1976-9	Outokumpu Mine technical group On-line process modeling Comminution and flotation control system development

1970-71 Vuonos mill Cu-Zn and Ni ores;  
Design of control systems  
Commissioning and ramp up of plant  
Operational development of plant

## OTHER PROFESSIONAL ACTIVITIES

### Memberships in scientific societies:

*Finnish Academy of Engineering Sciences*, member

*The Finnish Mining and Metallurgical Engineers Association (VMY)*

Member of section board (minerals processing) 1986-89

Chair of section board (minerals processing) 1989-91

Member, Board of Directors 1992-1994

Vice-president 1999- 2001

President 2002-2004

Past-President 2005-2007

*VMY; Research Council*

Section (minerals engineering) chair 1995-1997

Chair 1997-1999 (*ex officio* member, Board of Directors of VMY)

*The Finnish Fine Particle society*

Chair, Board of directors 1985-1997

Honorary member 1998

*The Finnish Chemical Engineering Society*, member

*European Federation of Chemical Engineers*

Member of particle sizing working group

Member of agglomeration working group

Member of the comminution working group

Chair 2007-2011

*The Society of Control and Automation Engineers in Finland*, member

*The Society of the American Institute of Mining, Metallurgical and Petroleum engineers (SME)*, member

*Canadian Institute of Mining and Metallurgical Engineers (CIM)*, member

*The Minerals, Metals and Materials Society (TMS)*, member

*The American Institute of Chemical Engineers (AIChE)*, member

*International Mineral Processing Congress (IMPC)*

Member, Council, 2008-2018

Member, International Advisory board 1985-present

Chair, Sustainability Commission 2015-2018

Member, Educational committee 2008-2018

### Evaluations for professorial chairs;

14 national and 15 internationals

### Other scientific work

Convener ISO Scientific Committee TC24/SC 4 working group 11 (sampling of particulate materials, sample splitting, reference materials) 1995-2012

*Minerals Engineering Journal*

Member of editorial board 1997-2013

*Minerals & Metallurgical Processing Journal (SME)*

Member of editorial committee 2006-8

*International Journal of Mineral Processing*

Editor 2007-2013

*Nordmintek* (Nordisk mineralteknisk forskningsråd ; Nordic mineral research assoc.

Chair, Board of Directors 1994-1996

Member, Board of Directors 1992-1994, 1996-2004

*Agricola Research Center*, Luleå Technical University,

Member of Board 2000-2008

*Hjalmar Lundboms 100 års forskningsstiftelse* (H.L. Centenary research foundation) Luleå  
Technical University,

member of board, 2005-2016.

*Vinnova*, (Swedish Engineering Research Foundation), mineral and mining program

expert board member 2007-2016

*EU FP5-7, Horizon 2020*

evaluation expert 2003-present

*EU ETV program*,

National delegate 2012- present

*United Nations Environmental Program (UNEP)*

recycling expert board 2010-3

*Stiftelse för Strategisk forskning, Sweden*,

expert team member 2011-

European Institute of innovation and Technology funded *Raw Materials Knowledge and Innovation  
Community*,

member of the Chairs Committee 2012-Nov.2014.<sup>1</sup>

Evaluated several candidates in Finland, Sweden, the Netherlands, USA, Canada, RSA, Japan  
and Australia for various grants and awards.

Evaluated Project Proposals for: European Union Framework programs (last 2020), Engineering  
Research Council of Canada, National Science Foundation (USA), Vinnova (Sweden), Stiftelse för  
Strategisk forskning (Foundation for Strategic Research, Sweden), The Academy of Finland.

### **Directorships in other related societies:**

*Finnish Mining Industry Association*,

Member, Board of directors 1998-1999

Chair, Research council 1998-2001

*Federation of European Mineral Engineering programs*

Member, board of directors 1998-2015

### **Teaching:**

*Doctoral dissertations:*

Opponent or committee member in 13 national and 41 international Ph.D. dissertations.

Supervised 15 dissertations

Created a new doctoral student summer school (2009); 4S Summer Symposium on Sustainable  
Systems together with Academy of Finland, UNEP, UNESCO, Tech. Univ. Catalonia, Univ. Cardiff,  
Helsinki University and Univ. Melbourne.

*Master supervisions:*

Supervised over 150 M.Sc. students

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<sup>1</sup> A consortium with over 110 industry and academy members, with innovation focus on mining, processing,  
metallurgy, recycling and material substitution

## **PUBLICATIONS:**

### Books (monographs):

- Luokituskäsikirja, Etelä Saimaan Kustannus, Lappeenranta, 1988, ("Classification handbook" Finnish Text)
- Particle Classification, Chapman&Hall, London, 1993
- The Metrics of Material and Metal Ecology, Elsevier 2005 (with Reuter, Boin et al.)
- Metal Recycling, Opportunities, limits, infrastructure, UNEP web publication (with Reuter (lead author) et al.)
- Minerals Industry; Education and Training, 2013, Editors Cilliers, J , Drinkwater D. and Heiskanen K. (IMPC)
- Handbook of Recycling, Elsevier 2013, Worrell and Reuter (editors), chapter 5 (Theory and tools of physical separation/recycling) and Appendix 1 (Physical separation)

Over 300 scientific and technical articles, over 100 peer reviewed.

## **Awards**

- SVR R1 (Knight, 1<sup>st</sup> class, The Order of The Finnish White Rose) 2006
- Military Merit Medal 2008
- JvR (The Infantry Cross) 2005, with swords 2010.
- Eero Mäkinen silver medal (VMY), 2006
- AEL silver medal 2003
- Outokumpu Foundation professor grant 2007
- Teacher of the year 2005, Helsinki Univ. Tech. Student Union
- Excellence of teaching award, 2007, Technology Advancement Foundation, Ministry of Trade and Commerce.
- Outotec Senior Technology Prize 2019

## **Other**

- Military rank, Major 1995