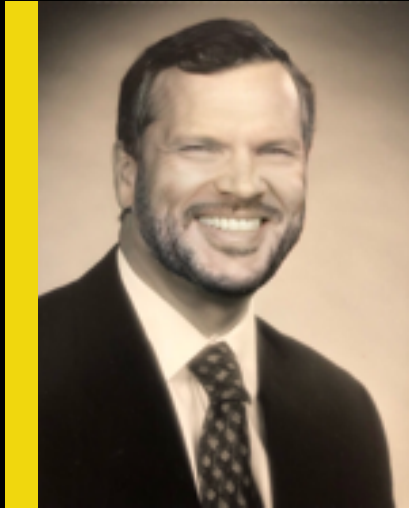




UATL® PRIVATE RESEARCH
UNIVERSITY est.2005

**RISTO O. ORAVA,
PHD (HIGH ENERGY PHYSICS),
PROFESSOR (HIGH ENERGY PHYSICS)**

CURRICULUM VITAE



RISTO O. ORAVA

Date of birth: 24 January 1951

Place of birth: Kemijärvi, Finland

KEY INFORMATION:

X-ray and neutron imaging detectors,
isotope level material identification,
development of radiation sensors,
VOC nanosensors, etc.

EDUCATION:

1971–1973 B.Sc. – Physics, University of Helsinki

1974 M.Sc. Physics, University of Helsinki, Helsinki

1977 Lic. of Philosophy – High Energy Physics,
University of Helsinki, CERN

1981 Ph.D. – High Energy Physics, University of
Helsinki, Fermilab

1983 Docent of Physics, University of Helsinki

2009 – ONINVITED NOMINATOR FOR THE NOBEL COMMITTEE FOR PHYSICS.

LEADERSHIP POSITIONS IN MAJOR INTERNATIONAL HIGH ENERGY PHYSICS COLLABORATIONS AT:

1. CERN, Geneva, Switzerland;
2. Fermi National Accelerator Laboratory, USA;
3. NASA, USA;
4. Founder of the Research Institute for High Energy Physics (SEFT);
5. Senior research scientist of UATL Private Research University.

CURRENT POSITION:

Since 1985 Member of Scientific Advisory Committees at CERN, Fermilab, several EU countries.

Since 1985 Finnish representative in CERN Science Policy Committee, Finance Committee, Advisor 1990-1995.

Since 1999 Professor of Experimental High Energy Physics, University of Helsinki, Finland, and Helsinki Institute of Physics, responsible for the Finnish research collaboration with CERN.

Since 1990 Associate Scientist at CERN, Geneva, Switzerland.



**SAMUEL CHAO CHUNG TING,
PROFESSOR, AMERICAN PHYSICIST**

RECEIVED NOBEL PRIZE FOR
DISCOVERING THE SUBATOMIC
J/ Ψ PARTICLE.

FOUNDER AND PRINCIPAL
INVESTIGATOR WITH PROFESSOR
RISTO ORAVA FOR THE
INTERNATIONAL \$2 BILLION
ALPHA MAGNETIC SPECTROMETER
EXPERIMENT INSTALLED ON THE
INTERNATIONAL SPACE STATION

Phone 617-253-5065
Fax 617-253-4100
Ting@ins.mit.edu
Samuel.Ting@cern.ch

February 10, 2020

To Whom It May Concern

I have known Professor Risto Orava, Helsinki Institute of Physics, Finland, for many years. He is a truly outstanding physicist who knows both instrumentation and has a deep insight into physics.

He is one of the founders of the Alpha Magnetic Spectrometer experiment on the International Space Station (see our publication in Nuclear Instruments and Methods in Physics Research A 350 (1994) 351-367). He has contributed enormously to the conceptual design and eventual success of the ultra-precise magnetic spectrometer on the International Space Station.

Professor Orava is a very creative person. He is capable of providing revolutionary ideas on Natural Science.

Samuel Ting
Thomas D. Cabott Professor of Physics

COOPERATION AND COLLABORATION:

1. SAMUEL CHAO CHUNG TING, PROFESSOR

Nobel Prize in 1976 for discovering the subatomic J/ ψ particle;

2. CARLO RUBBIA, PROFESSOR

Nobel Prize in Physics in 1984 for work leading to the discovery of the W and Z particles at CERN;

3. LEON MAX LEDERMAN, PROFESSOR

the Nobel Prize in Physics in 1988 for their research on neutrinos and the Wolf Prize in Physics in 1982 for their research on quarks and leptons and ;

4. ALEXANDER NIKOLAYEVICH SKRINSKY, PROFESSOR

Russian nuclear physicist, full member of the Academy of Sciences of the USSR in the Division of Nuclear Physics (High Energy Physics), full member of the American Physical Society and a foreign member of the Royal Swedish Academy of Sciences, was a member of CERN's.

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[http://inspirehep.net/search?](http://inspirehep.net/search?ln=en&p=find+a+orava&of=hb&action_search=Search&sf=earliestdate&so=d)

[ln=en&p=find+a+orava&of=hb&action_search=Search&sf=earliestdate&so=d](http://inspirehep.net/search?ln=en&p=find+a+orava&of=hb&action_search=Search&sf=earliestdate&so=d)

PUBLICATIONS 1080+:

publications on basic research, R&D, instrumentation and sensor technology, technology transfer and management of large international R&D organizations.

5 BOOKS PUBLISHED

BOOKS:**1. FUTURE PHYSICS AND ACCELERATORS**

ISBN: 9789810223601

**2. NEW DETECTORS FOR RADIOLOGY,
HELSINKI INSTITUTE OF PHYSICS, UNIVERSITY OF HELSINKI**

NSSMIC.2007.4437282

**3. PHYSICS AND EXPERIMENTS WITH LINEAR COLLIDERS (IN 2 VOLS)
(PROCEEDINGS SU)**

ISBN-13: 978-9810210540

ISBN-10: 981021054X

4. FORWARD PHYSICS & LUMINOSITY DETERMINATION AT LHC

SBN-13: 978-9810247348

ISBN-10: 9810247346

**5. A BOOK UNDER PREPARATION: REAL-TIME IDENTIFICATION OF MATERIAL
COMPOSITION OF OBJECTS; DEEP SENSING SYSTEMS**



EXPERIENCE IN TEACHING AND EDUCATION, SUPERVISOR OF:

PhD – theses - 31 by Summer 2017.

MSc – theses - 44 by Summer 2017, University of Helsinki, Helsinki University of Technology (Aalto University), Tampere University of Technology, Universities in U.S. , Germany, Italy and Switzerland.



EMPLOYMENT (employed by the University of Helsinki since 1973):

1977 – 1979 Research Associate Fellowship, CERN, Geneva.

1979 - 1983 Robert R. Wilson Fellow, U.S. Department of Energy, Fermilab (member of the scientific staff of the laboratory), Batavia, USA.

1984 – 1990 Senior Research Scientist, Academy of Finland.

1990 –1991 Professor in Particle Physics (locum) and Acting Chairman of the Department of High Energy Physics, University of Helsinki.

1991 – 1995 Staff Research Scientist, CERN/EP, Geneva.

1991 – 1996 Director and Founder of the Research Institute for High Energy Physics (SEFT), Finland.

1996 – 1999 Research Scientist and Program leader at the Helsinki Institute of Physics, CERN, Geneva.



CERN (Organisation européenne pour la recherche nucléaire):

1999 – 2019 Professor of experimental high energy physics (chair), assignment to CERN (18 years).

1990 – 1996 Director of Research Institute for High Energy Physics, CERN (6 years 6 months).

1991 – 1995 CERN Research Scientist (Staff).

1995 – 1999 CERN Senior Research Scientist, program leader at University of Helsinki and Helsinki Institute of Physics.

2000 – 2019 CERN Visiting Professor.

2019 – present CERN and Executive Committee Member of the MoEDAL Experiment at the CERN LHC.

Founded and led the national organization for CERN related research (SEFT), founded the Detector Laboratory in Finland, R&D and technology transfer, Cerntech concept.

Leading positions in a frontier high energy physics experiments: created novel experimental concepts, instrumentation and sensor solutions for major high energy physics experiments, CMS co-spokesman.

MAJOR CONTRIBUTIONS IN EXPERIMENTS AT CERN:

DELPHI (physics analysis coordination, gas amplified detectors, silicon detectors),

TOTEM (forward physics coordination, MPG-detectors),

ALICE (physics coordination, scintillator detectors),

MoEDAL (member of the executive committee).



UNIVERSITY OF HELSINKI /HELSINKI INSTITUTE OF PHYSICS:

December 1999 – 2019 Joint Chair professor in experimental high energy physics at the University of Helsinki and Helsinki Institute of Physics (18 years).

Professor in experimental high energy physics, visiting professor at CERN (6 months per year).

Currently leads research groups in:

1. CERN experiments ALICE, MoEDAL & LHC Ring initiative;
2. in CDF experiment at Fermilab;
3. 1991–1996 Program leader at the Helsinki Institute of Physics.

Founder of Finnish National Institute for High Energy Physics (SEFT).

Founder of HIP/UH Detlab (previously SEFT Detector Laboratory in Finland).

Organizer of applied research technology transfer activities: Founder and Chairman of the Board of Directors of CERNTECH Ltd (Cerntech Ltd. established the highly successful model for technology transfer activities between CERN and Finland and consulted CERN and its member states on industrial cooperation).

Founding member of several technology companies, e.g. Detection Technology Oy,



FERMILAB 1979–1984:

FERMILAB Research Scientist (Staff) - Robert R. Wilson Fellow.

Research in Fermilab neutrino experiments E180 (F.Nezrick) and in E605 (Leon Lederman) Robert R.

Wilson Fellow at Fermilab

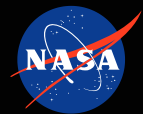
Physics Analysis Coordinator.

2002 – 2019 Fermilab visiting professor from University of Helsinki & Helsinki Institute of Physics.

2002 – present Leading Finnish participation in the CDF-Tevatron Collaboration as a Visiting Professor at Fermilab,

2002 – present CDF Executive Committee Member.

Major contributions in the CDF experiment at Fermilab (physics analysis, silicon detector system).



NASA and ESA (European Space Agency) 1992-2013

1. 1996-2000 EU Concerted Action Leader on Novel X-Ray Imaging Technologies.

2. Recognised for Major contributions to space research: AMS experiment/ INTERNATIONAL SPACE STATION (S.C.C. Ting, MIT).

3. Group leader and a member of the original coordinating team for development of LARGE SILICON TRACKING DETECTOR.

4. SIDER/ESA, active radiation shielding development, coordinating team leader.

UNIQUE TECHNOLOGIES ARE PROTECTED



82

PATENTS



3

PATENTS PENDING

Professor Risto Orava received his first patent in 1994.

LIST OF SEVERAL PATENTS:

1. A SYSTEM AND A METHOD FOR PRODUCING INFORMATION INDICATIVE OF DIABETES (WO2019058021).
2. APPARATUS FOR MEASURING RADIATION (CN110062896, EP3555667, GB2557926, WO2018109276).
3. A SYSTEM AND A METHOD FOR COMPOSITIONAL ANALYSIS (WO2018202946).

82 ACTUAL PATENTS

AU1997019262	EP0854644	GB2474721	US6035013
CA2191100	EP0864171	GB2557926	US6046068
CA2238827	EP0886791	GB2562215	US6163028
CA2248733	EP1001469	GR3035628	US6215123
CN102695968	EP2227828	NZ287868	US6268605
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DE000069505375	ES2123991	US20020089595	WO1997034164
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EP0763302	GB2289983	US20130015363	WO2012146415
EP0847596	GB2305095	US20130015363	WO2014131949
EP0853427	GB2305096	US20130020661	WO2018109276
EP0854639	GB2307785	US20140077089	WO2018202946
EP0854643	GB2311198	US5812191	WO2019058021
	GB2474720	US5955733	

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82 REGISTERED PATENTS
3 PATENTS PENDING
6 TECHNOLOGIES IN THE TEST PHASE

Production of prototypes and detectors is carried out on the basis of DEEP SENSING TECHNOLOGIES OY, est. 2012.



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UATL® PRIVATE RESEARCH
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FOUNDED IN 2005

Works, research and experiments in the field of accelerator physics of elementary particles.



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