



KTH Teknikvetenskap

## Protokoll

Närvarande: Gustav Amberg  
Karin Blom  
Laszlo Fuchs  
Ulf Karlsson  
Anders Szepessy

Anders Forsgren  
Anna-Karin Burström

### 1. Mötets öppnande

Ordförande Gustav Amberg förklarar mötet öppnat.

### 2. Anmällda förhinder

Ulf Gedde, Mats Åbom och doktorandrepresentant har anmält förhinder för närvaro vid mötet. Mark Pearce är frånvarande.

### 3. Närvaro- och yttranderätt

Anders Forsgren och Anna-Karin Burström föreslås få närvaro- och yttranderätt under hela mötet.

Strategiska rådet beslutar

**att** Anders Forsgren och Anna-Karin Burström ges närvaro- och yttranderätt under hela mötet.

### 4. Val av justeringsperson

Laszlo Fuchs föreslås som justerare för mötet.

Strategiska rådet beslutar

**att** att välja Laszlo Fuchs som justerare för strategiskt rådsmöte 2 2012.

### 5. Fastställande av föredragningslista [bilaga 1]

Strategiska rådet beslutar

**att** behandla punkt 11 omedelbart efter punkt 7.

**att** föredragningslistan fastställs med gjorda ändringar.

6. Föregående protokoll (rådsmöte 16 November 2011)

Strategiska rådet beslutar

**att** lägga protokollet från rådsmötet 16 november 2011 till handlingarna.

7. Anmälningar[bilaga 2]

KTHs kontaktperson på utbildningsdepartementet har meddelat att det finns ett färdigt lagförslag angående biträdande lektors-anställningar. Departementet inväntar eventuell lösning med facket.

KTH ska se över karriärutvecklingen för akademiska tjänster som inte ingår i tenure track. Även forskare och adjungter ska erbjudas en tydlig karriärväg.

KTH ska ta fram en ny utvecklingsplan för 2013-2016. Skolorna ska ta fram egna planer till hösten.

Numerisk analys flyttar över till institutionen för matematik. En fördel är att man kan skapa synergier inom utbildning och forskning. Administrativt ska flytten vara genomförd 1 juli 2012. Den fysiska flytten ska lösas framöver.

Fredrik Lundell är utsedd till årets lärare på KTH

Mats Boij avgår som GA och Lars Philipsson på Matematik tar över. Skolan måste därmed hitta en ny programansvarig på T.

Skolan har föreslagit Carel Faber och Dan Henningsson till Wallenberg Scholar. Dan Henningsson har valts ut som ett förslag av totalt tre från KTH.

Medel för Infrastruktursatsningar kan ansökas hos KAW. En tvåsidig beskrivning skickas till grants office senast den 23 april. Det är viktigt att vi ser över vilka potentiella infrastrukturer vi har.

Skolchefernas mandat löper ut i slutet av 2012. Rektor kommer att tillfråga lärarna, TA-representant och doktorandrepresentant i strategiska rådet om förslag. Förslag på kandidater ska vara klart i juni.

Anders Forsgren redovisar genomförda disputationer och licentiatseminarier enligt bilaga.

*Jakob Kutteneuler anländer till mötet*

11. Presentation av doktorsprogrammet, Farkostteknik

Jakob Kutteneuler presenterar doktorandprogrammet i Farkostteknik. Ett förslag på skolgemensam introduktion för doktorander diskuteras.

8. Rekryteringsärenden, fakultetsförnyelse och jämställdhet

a. Förnyelse av arbetsformer

Anders Forsgren informerar om att det nu ska finnas beredningskommittéer för varje ärende. Det finns inte längre något krav på strategiskt skoloråd men vi fortsätter med rådet eftersom det är viktigt att tjänsteärenden granskas och diskuteras.

Halvtidsutvärderingar ska hållas med alla biträdande lektorer.

b. Rapport av pågående ärenden[bilaga 3]

Anders Forsgren presenterar pågående rekryteringsprocesser samt könsfördelningen bland akademiska tjänster.

c. Affilierad professor i Lättkonstruktioner[bilaga 4]

Gustav Amberg och Anders Forsgren föredrar ärenden.

Strategiska rådet beslutar

att föreslå skolchefen att tillstyrka ärendet.

d. Affilierad professor i medicinsk bildfysik [bilaga 5]

Anders Forsgren och Gustav Amberg föredrar ärendet. Ulf Karlsson väcker fråga om jäv eftersom han har samarbetat med Mietek Bakowski. Rådet bedömer att det inte förekommer jäv eftersom de berörda inte har sampublicerat. Mietek Bakowski

är nära pensionsålder och rådet diskuterar eventuella komplikationer kring detta.

Frågan tas vidare till Sophia Hober.

Strategiska rådet beslutar

att föreslå skolchefen att tillstyrka ärendet med förbehåll att det inte uppkommer några komplikationer i och med pensionering.

#### e. Lektor i kärnkraftssäkerhet[bilaga 6]

Gustav Amberg och Anders Forsgren föredrar ärendet. Huruvida Janne Wallenius kan anses vara en "outside expert" diskuteras.

Strategiska rådet beslutar

att föreslå skolchefen att tillstyrka ärendet.

#### 9. Diskussion kring KTHs möjlighet att bli stiftelse

En viktig aspekt att ta hänsyn till är huruvida beslutet är förankrat även hos oppositionen. Övergången till ny bolagsform kan visa sig verkningslös vid eventuellt maktskifte om det inte finns en politisk enhet.

#### 10. Övriga frågor

Mark Pearce blev prefekt vid årsskiftet vilket innebär att strategiska rådet får en vakans. Fyllnadsval kommer att hållas inom kort.

#### 11. Nästa möte

8 juni 2012 kl: 09.00, matematiks sammanträdesrum

#### 12. Mötets avslutande

Gustav Amberg avslutar mötet.

Vid protokollet

\_\_\_\_\_  
Anna-Karin Burström

Justeras

\_\_\_\_\_  
Gustav Amberg

\_\_\_\_\_  
Lazlo Fuchs



Bilaga 1

## Föredragningslista

\*= bilaga finns

1. Mötets öppnande
2. Anmälda förhinder
3. Närvaro- och yttranderätt
4. Val av justeringsperson
5. Fastställande av föredragningslista
6. Föregående protokoll (rådsmöte 20 januari 2012)
7. Anmälningar\*
8. Rekryteringsärenden, fakultetsförnyelse och jämställdhet
  - a. Förnyelse av arbetsformer
  - b. Rapport av pågående ärenden
  - c. Affilierad professor i lättkonstruktioner\*
  - d. Affilierad professor i medicinsk bildfysik\*
  - e. Lektor i kärnkraftssäkerhet\*
9. Diskussion kring KTHs möjlighet att bli stiftelse
10. Övriga frågor
11. Presentation av doktorsprogrammet Farkosteknik, Jakob Kutteneuler
12. Nästa möte
13. Mötets avslutande

# Disputationer

31

januari

tisdag, 13:00

Disputationer

Fibrations and Idempotent Functors

Matematik

Respondent: Martin Blomgren

3

februari

fredag, 10:00

Disputationer

Mechanochemical Modeling of Smooth Muscle Activation

Hållfasthetslära, biomekanik

Respondent: Sae-Il Murtada

14

februari

tisdag, 10:15

Disputationer

Transmutation of americium in sodium fast reactors and accelerator driven systems

Fysik, Reaktorfysik

Respondent: Youpeng Zhang

17

februari

fredag, 13:00

Disputationer

Studies of Dark Matter in and around Stars

Teoretisk fysik

Respondent: Sofia Sivertsson

17

februari

fredag, 13:00

Disputationer

Parity check systems, perfect codes and codes over Frobenius rings

Matematik

Respondent: Thomas Westerback

12

mars

måndag, 10:00

Disputationer

Methods for Reliability based Design Optimization of Structural Components

Hållfasthetslära

Respondent: Tomas Dersjö

13

mars

tisdag, 14:00

Disputationer

Efficient Finite Element Approach for Structural-acoustic Applications including 3D Modelling of  
Teknisk akustik

Respondent: Romain Rumpler

23

mars

fredag, 10:15

Disputationer

Capillarity and Dynamic Wetting

Teknisk mekanik

Respondent: Andreas Carlson

30

mars

fredag, 13:00

Disputationer

Spin-Diode Effect and Thermally Controlled Switching in Magnetic Spin-Valves

Fysik

Respondent: Sebastian Andersson

30

mars

fredag, 13:00

Disputationer

Aerodynamics and Lateral Control of Tailless Aircraft

Flygteknik

Respondent: Gloria Stenfelt



# Licentiatseminarier

22

februari

onsdag, 13:00

Licentiatseminarier

Automatic counting and migration analysis of immune cells imaged in micro-well chips

Biologisk fysik

Licentiand: Mohammad Ali Khorshidi

9

mars

fredag, 10:00

Licentiatseminarier

Quality Assessment of Protein Models

Biologisk fysik

Licentiand: Arjun Ray

Institution	Ämnesområde	Dnr	Anställn- profil fastställd	Sista ans dag	Sökande ( kvinnor	Sakkunniga utsedda	TFN möten	Status	ATT GÖRA
<b>Lektor</b>									
Fysik	Lektor i tillämpad fysik	VL-2011-0080	2011-06-09	2011-09-12	5(0)	2011-11-15 Catharina Svanborg, Lunds universitet och Karl-Eric Magnusson, Linköpings universitet		Förelägen Björn Önfeldt	Underlag skickat till skolan för beslut
Fysik	Lektor i tillämpad fysik	VL-2011-0079	2011-06-09	2011-09-12	8(1)	2011-10-04 Wolfgang Sohler, universitet Paderborn, Roberta Lampori, Politecnico di Milano		Katia Gallo förelägen. Underlag skickat till skolchefen för beslut.	Underlag skickat till skolan för beslut
Teoretisk fysik	Lektor i teoretisk fysik	VL-2012-0017				Behandlas i beredningsmöte 14/2		AU BEREDNING 14/2 Ska upp till FR. Ta upp i beredningsmöte 14/2. Har bett skolan, Mats Wallin, komplettera brevet.	Klart i AU 21/2 sedan FR 20/3. Beslut och annons.
Matematik	Lektor i matematik, särskilt analys	VL-2011-0105	2011-11-01	2012-01-09	15(1)	Klart. Professor Panagiotis Daskalopoulos, Columbia University, Professor Vladimir Maz'ya, Mikhail Sodin. Handlingar skickade till sakkunniga.		Underlag hos sakkunniga för bedömning	Deadline skk utlåtande 4 maj. Mötesplanering.
Matematik	Lektor i matematik, särskilt topologi	VL-2011-014	2011-11-01	2012-01-09	13(1)	Professor Bob Oliver, Université Paris 13, Professor Ursula Hamenstädt, Rheinische Friedrich- Wilhelms-Universität Bonn			Deadline skk utlåtande 4 maj. Mötesplanering.
Matematik	Lektor i matematisk statistik	VL-2011-0120	2011-12-13	2012-04-01				Ute på annons till 1 april	Annons

Biträdande lektor									
Farkost och Flyg	Bitr lektor i Konceptuell fordonsdesign	S-2011-0715	2012-10-04	2011-12-05	4	Klart. Professor Thilo Bein, Professor Elena Lomonova TU Eindhoven Fraunhofer/TU Darmstadt		Underlag hos sakkunniga för bedömning	Underlag skickat till sakkunniga. Begärt underlag till 30 mars 2012. Förelagarna möten 16,17,18 april.
Matematik	Bitr lektor i Optimeringslära och systemteori	S-2011-0757	2011-11-01	2012-01-09	11			Inkommit förslag till beredning, 15/3 kl. 15:00 -16:00	OK AUberedning 15/3 Upp i AU 27/3
Fysik	Bitr lektor i Teoretisk fysik med iniktning mot astropartikelfysik	S-2011-0494	2011-06-23	2011-08-29	10(0)	Klart. Belen Gavela, Michael Kachelrieß, NTNU	TFN 17 nov och 14 dec	Ärendet skickat till skolan för beslut	Underlag skickat till skolan för beslut

bilaga 3

Docenter						
Namn	Ämnesområde	Inkomst datum	Diarienum	Beslut sakkunnig	Beslut kommitté	Status
Jakob Jonsson	Matematik	2011-10-04	V-2011-0631	2011-11-01	2011-11-01	Underlag skickat för lärarprov i januari 2012. Beslut till Sophia 15 mars.
Ozan Öktem	Matematik	2011-10-01	V-2011-0681	2011-11-01	2011-11-01	Underlag skickat till ordföranden för lärarprov
Artem Kulachenko	Hälfasthetslära	2011-12-17	V-2012-0035	Au 24/1	Au 24/1	Underlag hos sakkunnig
Hans Bornefalk	Medicinsk bildfysik	2011-12-19	V-2011-0835	Au 24/1	Au 24/1	Underlag hos sakkunnig
Björn Önfelt	Cellulär immunologi	2011-07-04	V-2011-0486	2011-09-06	2011-09-06	Docent, ej hämtat docentbevis



bilaga 4

## **KTH Farkost och flyg**

2012-03-22

Dean SCI KTH

### **Proposing Professor Gary B. Marquis being appointed an affiliated professor at KTH**

KTH Department of Aeronautical Vehicle Engineering proposes that Professor Gary B. Marquis is appointed as an affiliated professor at KTH. The grounds for that proposition is the following:

KTH and Aalto University have a strong history of faculty collaboration. On this basis several joint courses have been developed, numerous joint papers have been published and substantial research funding has been granted. The Presidents of both universities have also several times promoted the value of these links.

Gary B. Marquis holds the position Professor of Mechanics of Materials, Aalto University, Department of Applied Mechanics. KTH, Volvo CE, SSAB and several other Swedish universities and companies have, since the end of the 80's, collaborated with Professor Gary Marquis. The collaboration started with a series of Nordic research projects concerning the fatigue of welded and cast components. In total, 5 collaborative Nordic research projects have been completed. Prof Marquis has also participated in several seminars, conferences and examination boards and as opponent at doctoral dissertations at KTH Lightweight Structures. Staff members at KTH have also been collaborating with Prof Marquis within the IIW (International Institute of Welding) since the beginning of 2000. Prof Marquis is the Chairman of the Commission on Fatigue of welded Structures and Components. Dr. Barsoum is the chairman of a major Working Group within that Commission (IIW XIII WG2) which studies improvement techniques for fatigue life enhancement of welded structures. Prof Marquis' research team at Aalto University is also very active in this field.

The research group at Lightweight Structures which works with welded structures has had several meetings with Prof Marquis' research group working on mutual research topics. The plan is to have two meetings each year, one at each institution, in order to present research results, discuss research issues, write common papers for publications and define new research proposals. The next meeting will be held at Aalto University in March 2012.

An affiliated professorship could enhance research and educational activities at both universities in several ways:

- Development of graduate courses within fatigue and fracture of lightweight structures which could be given at both universities
- Stronger collaboration in research and possible exchange of PhD students between the universities
- Shared supervision of PhD students
- Shared journal publications
- Joint applications for research funding

It also provides a certain formal acknowledgement of the joint efforts, emphasising the collaboration between Alto and KTH.

Regards,



Leif Kari

Prefekt

## Curriculum Vitae

**Gary B. Marquis**

### Home address:

Riihikatu 1  
FIN-53100 Lappeenranta  
Finland

### Work address:

Aalto University  
P.O. Box 14300  
FIN-02015 TKK, Finland  
Phone: +358- 9-470-23440  
Mobile: +358- 40-720-1093  
e-mail: gary.marquis@tkk.fi

### Personal information:

Date of Birth: March 1, 1957  
Family: Male, Married with three children  
Citizenship: USA / Finnish (naturalized 13.07.2005)  
Languages: English - mother tongue  
Finnish - very good

### Professional Experience:

2008–present	Professor of Mechanics of Materials, Aalto University School of Engineering, Department of Applied Mechanics
2001 – 2008	Professor, Department of Mechanical Engineering, Lappeenranta University of Technology, Director Laboratory of Steel Structures
1994 - 2001	Senior Research Scientist, VTT Manufacturing Technology, Espoo.
1988 - 1993	Research Scientist, VTT Metals Laboratory, Espoo. Fatigue and fracture mechanics testing and analysis.
1985 - 1987	Research Fellow, Department of Theoretical Mechanics, Silesian Technical University, Gliwice, Poland. Stress, vibration and failure analysis of mechanical components; Finite element analysis
1982 - 1984	Teaching and research assistant. Department of Mechanical and Industrial Engineering, University of Illinois, Urbana-Champaign, IL.
1981 - 1982	Staff Engineer, Polytechnic, Inc., Chicago, IL, Mechanical failure analysis and component testing.
1979 - 1981	Project Engineer, Department of System Installation Engineering, Western Electric Co., Rolling Meadows, IL.

### Short-term Professional Assignments:

1.10-11.12.2000 Visiting research professor, Kyushu University, Fukuoka, Japan  
1.11.95-31.10.96 Visiting research scientist, University of Illinois at Urbana-Champaign.

## 2. Education

1979	B.Sc.	General Engineering, University of Illinois at Urbana-Champaign
1984	M.Sc.	Mechanical Engineering, University of Illinois at Urbana-Champaign
1995	D.Sc.	Mechanical Engineering, Helsinki University of Technology, Laboratory of Engineering Materials

## 3. Academic supervising experience

### *Doctoral theses*

Juha Kilkki 2002 "Automated formulation of optimisation models for steel beam structures" – passed with honours  
Mika Bäckström 2003 "Multiaxial fatigue life assessment of welds based on nominal and hot spot stresses"  
Xiaoyan Li 2003 "Effect of mechanical and geometric mismatching on fatigue and damage of welded joints"  
Tapani Halme 2004 "Novel techniques and applications in generalized beam theory"  
Timo Björk 2005 "Ductility and ultimate strength of cold-formed rectangular hollow section joints at sub-zero temperatures" – passed with honours  
Veli-Matti Lihavainen 2006 "A novel approach for assessing the fatigue strength of ultrasonic impact treated welded structures"  
Ilkka Poutiainen 2006 "A modified structural stress method for fatigue assessment of welded structures"  
Ahti Oinonen 2011 "Damage modelling procedure and positioning optimization of adhesively reinforced frictional interfaces" (to be defended 2011)

### *Diploma and T. Lic. theses*

58 MS and two T.Lic. theses during the period 2002-2010.

## 4. Other scientific achievements

### *Assignments as examiner opponent*

Doctoral thesis examiner or pre-examiner – more than 20 times in Finland, Sweden, Norway, Denmark, Switzerland and South Africa

### *Review referee assignments*

I regularly serve as for the following publications *International Journal of Fatigue*, *Fatigue and Fracture of Engineering Materials and Structures*, *ASTM*, *ASME*, and *International Journal of Fracture*, and *Welding in the World*. I have reviewed and average of about 5 articles per year for the past 5 years. I have also been a referee for numerous conference special publications.

Member of the editorial board and principal reviewer *Welding in the World*

Guest editor for a special edition of *International Journal of Fatigue*

### *Project referee assignments*

Funding application evaluator – The European Science Foundation; 2005 - present

Funding application evaluator – The Research Council of Norway; 2004 – present

### *Other important trust positions and international activities*

- 2011-2014 Director International Institute of Welding.
- 2011- 2014 Chairman of the Technical Management Board of the International Institute of Welding. This group oversees the functions and cooperation of the 23 Technical working units in the organisation.



- 2006-2012 Chairman of the International Institute of Welding Commission XIII - Fatigue of Components and Structures. Elected in 2006 and re-elected in 2009 for a second 3 year term. This is the most active commission in the organisation and has a long record of significant technical achievements. The commission constitutes 50 active members from 20 countries.
- 2009 – present Chairman of the International Programme Committee in Mechanical Engineering at Aalto University
- 2011-2013 Member of the Faculty of Engineering Tenure Board
- 2008 – 2011 Member of the IIW Technical Management Board
- 2004-2006 IIW International Accreditation Board working group chairman – Weld designer curriculum guideline
- At LUT: Chairman of the international programs steering group 2003-2008, Deputy head of Mechanical Engineering department 2005 – 2006, Scientific Council member 2002 – 2006, Professors' Union, local chapter steering group member 2005 - 2007

#### 5. National and International research funding 2001-2007

<i>Project</i>	<i>Period</i>	<i>Primary finding Agency</i>	<i>Funding k€ (total / own)</i>	<i>Leader / Co-leader</i>
<b>FATWELDHSS</b>	2010-2013	EU Research Fund for Coal and Steel, International industrial consortium and Aalto University	1 800 / 108k€	Ahmed (Arcelor-Mittal, BE) / Marquis
To develop methods for improving the performance of welded high-strength steels (yield strength of 700 and 960 MPa) at thicknesses of 5-20 mm for use in fatigue-loaded welded structures				
<b>Fimecc – LIGHT SPR</b>	2009-2013	Ruukki, Metso, Outokumpu, STX Europe / National Technology Agency of Finland	8 080 / 1 460k€	Marquis
To gain a leading international position in the development of a future generation of advanced materials, structures and systems, with reduced weight, increased performance, improved energy efficiency and a reduced environmental footprint.				
<b>FIDiPro-SM</b>	2009-2013	Ruukki, Wärtsilä, VTT	690 k€	Marquis
Funding for Finland Distinguished professor Gregory Glinka to Aalto University				
<b>Fate-Defex</b>	2008-2011	Ovako Bar, Wärtsilä, Metso, VTT / National Technology Agency of Finland	1 080 / 60k€	Solin (VTT) / Marquis
To improve and verify mechanism-based and probabilistic models used for assessment of fatigue and failure probability of ultra-clean steels				
<b>eLusiter</b>	2006-2009	Ruukki, New Boliden, KS-Sinkki, YIT / National Technology Agency of Finland	400/80 k€	Tiainen (TUT) / Marquis
The goal is to define process parameters for zinc coated high strength steel structures to avoid pre-mature fracture				
<b>Ultrasteel</b>	2005-	Ruukki / National	200 k€	Marquis

	2008	Technology Agency of Finland		
Design issues for implementing high strength bainitic steels for weight critical structures				
<b>VIDIMS</b>	2004-07	Lappeenranta University of Tech.	280/140	Heikki Handroos (LUT) / Marquis
This is part of the universities own centre of excellence program to support mechanics based computer modelling of complex mechanical engineering systems				
<b>Ruostumaton</b>	2005-08	National Technology Agency of Finland	600/200	Mika Siren (VTT) / Marquis
The goal of this project is to increase the use of new stainless steel grades in the transportation and process industries by providing basic design and life cycle cost data.				
<b>Martsi</b>	2005-08	National Technology Agency of Finland	602/160	Heikki Handroos (LUT) / Marquis
The goal of the current project is to create operational models that would permit stochastic effects and operator variation to be considered in the simulation of mechatronic machines.				
<b>Laatu</b>	2004-06	National Technology Agency of Finland	346	Marquis
Development of a weld quality system for fillet welded joints.				
<b>Q-FAB</b>	2004-07	Nordic Innovation Centre / Industry	3000/186	Jack Samuelsson (Volvo) / Marquis
A Nordic research initiative using an integrated research approach to the development of future generations of fabricated structures. The integrated research approach includes coordinated efforts in several key technologies: high-speed welding processes, high strength materials, cost-effective NDE, post-weld treatments and FE-based design assessment tools.				
<b>Multicast</b>	2003-06	Finnish Academy	140	Marquis
The goal is to investigate damage parameters for multiaxially loaded heavy -walled castings				
<b>Konemasina</b>	2003-06	National Technology Agency of Finland	500/160	VTT / Marquis
The goal is to develop statistically based methods for improving the safety and reliable design of complex machines with multiple degrees of freedom				
<b>Gjutdesign</b>	2001-04	Nordic Innovation Centre / Industry	/68	Jack Samuelsson (Volvo) / Marquis
Improvement of inspection methods and fatigue design methods for cast structures in fatigue loaded structures				
<b>RFCS 7210-PR-253</b>	2001-04	EU	/190	Steve Maddox (TWI) / Marquis
The goal is to establish methods for achieving improved fatigue resistance of welded joints in austenitic and duplex stainless steels with a target increase of 60% by suitable choice and control of welding process and the application of a post-weld improvement technique.				

## Publications List Gary B. Marquis (1957)

### Articles in refereed scientific journals

1. Yildirim, H. C. and Marquis, G. B., Overview of fatigue data for high frequency treated welded joints, *Welding in the World*, (Submitted).
2. Mikkola, E., Solin, J. and Marquis, G., Mesoscale modelling of crack initiation from inclusions in steel, *Int J Fatigue*, (Submitted).
3. Oinonen A. and Marquis, G. Cohesive zone modelling of adhesive reinforced bolted lap joints, *Engineering Fracture Mechanics*, (Submitted).
4. Jonsson, B., Samuelsson J. and Marquis, G., Development of weld quality criteria based on fatigue performance, *Welding in the World*, 56, issue 5/6, 2012 (in print).
5. Oinonen, A. and Marquis, G. Shear decohesion of clamped abraded steel interfaces reinforced with epoxy adhesive, *Int J Adhesion Adhesives*, 31, issue 6, 2011, pp. 550-558.
6. Hurme, S., Oinonen, A. and Marquis, G., Fatigue of bonded steel interfaces under cyclic shear loading and static normal stress, *Engineering Fracture Mechanics*, 78, issue 8, 2011, pp. 1644-1656.
7. Oinonen, A. and Marquis, G. A parametric shear damage evolution model for combined clamped and adhesively bonded interfaces, *Engineering Fracture Mechanics*, 78, issue 1, 2011, pp. 163-174.
8. Marquis, G., Failure modes and fatigue strength of improved HSS welds, *Engineering Fracture Mechanics*, Vol.77, No.11, pp. 2051-2062, 2010
9. Fujita, S., Matsuoka, S., Murakami, Y. and Marquis, G, Effect of Hydrogen on Mode II Fatigue Crack Behavior of Tempered Bearing Steel and Microstructural changes, *Int J Fatigue*, 32, pp. 943-951, 2010.
10. Oinonen, A., Tanskanen, P., Björk, T. and Marquis, G., Pattern optimization of eccentrically loaded multi-fastener joints, *Structural and Multidisciplinary Optimization*, 2010, 40, pp. 597-609
11. Nykänen T., Marquis G. and Björk T., A simplified fatigue assessment method for high quality welded cruciform joints, *Int J Fatigue*, 31, 2009.
12. Heinilä, S., Marquis, G. and Björk, T., The influence of residual stresses on the fatigue strength of cold-formed structural tubes, *Journal of ASTM International*, 5, 2008, 11p.
13. Björk, T., Henilä, S. and Marquis, G., Assessment of sub-zero fracture of a welded tubular K-joint, *ASCE J. of Structural Engineering*, 134, No. 2, 2008, pp. 181-188.
14. Heinilä, S., Marquis, G. and Björk, T., Observations on Fatigue Crack Paths in the Corners of Cold-Formed High Strength Steel Tubes, *Engineering Fracture Mechanics*, 75, No. 3-4 2008, pp. 833-844.
15. Björk, T., Samuelsson, J. and Marquis, G., The need for a weld quality system for fatigue loaded structures, *Welding in the World*, 52, issue 1/2, 2008, pp. 34-46.
16. Nykänen T., Marquis G. and Björk T., Fatigue analysis of non-load-carrying fillet welded cruciform joints, *Engineering Fracture Mechanics*, 74, Issue 3, 2007, pp. 399-415.
17. Björk, T., Marquis, G., Pellikka, V., and Ilvonen, R., An experimental and numerical study on the fracture strength of welded structural hollow section X-joints, *Journal of ASTM International*, 3, No. 6, 2006, 14p.

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## Teaching Portfolio

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3. Teaching Administration

### 1. Teaching-Learning Philosophy

Teachers of university-level engineering curricula must always have twin objectives in mind: to equip future practising engineers and to train future researchers. Successful students require a strong foundation in mechanics, strength of materials, mathematics and physics. On this foundation, they are able to learn the analytical tools and to develop analytical approaches to problem solving. An analytical approach to problem solving can only be gained by repetition. Concepts developed during lectures must be reinforced by suitable computation exercises in which the student must learn to select which approach to a problem yields an *effective* answer. For example, in a basic course like first year dynamics, simple problems can normally be solved using a variety of methods (conservation of energy, impulse and momentum, etc.) and coordinate systems (polar coordinates, Cartesian coordinates, etc.). All methods result in the same solution since all are derived from Newton's laws of motion, but normally, one method produces the answer with moderate effort and the others demand much more complicated computations. By practice and repetition, students learn to assess the information given and then choose the appropriate solution method.

Within the field of solid mechanics, my specialization is the design and analysis of demanding load-carrying engineering structures. These particularly require an understanding of material behaviour, material behaviour modes and mechanics of structural joints. Students studying mechanical engineering structures are required to learn many concepts that tend to be abstract. For this reason, I have tried to increase the number of laboratory exercises and laboratory demonstrations used in courses. For example, in a course I have taught, *Design of Steel Structures*, each year included demonstrations on the ultimate strength of end welds and side welds. The demonstrations tend to be dramatic since even rather small welds can sustain relatively high forces. Typically, the welds fail at loads exceeding several tonnes and the final fracture releases significant energy (and noise!). In the subsequent laboratory report, students compare the predicted failure strength with the measured strength and, especially, investigate if the failure mode is near to the mode assumed in the analytical models.

In the 2011 edition of the first year course, *Dynamics I*, we introduced the internet-based teaching tool [www.masteringengineering.com](http://www.masteringengineering.com). This tool was used to replace traditional pen and paper-type homework assignments. Students were given several sample problems and two mandatory problems each week. The program was designed with excellent graphics and included help windows to assist the students if they encountered difficulties. While there were a few complaints, the vast majority of the more than 400 students who took the course greatly appreciated this tool. The end result was that 75% of the students passed the course during the first exam possibility, about 10% higher than average. In association with the Aalto Design Factory, we are also developing educational videos which will hopefully help students to gain an improved physical understanding of the basic concepts being presented.

With respect to courses in the fourth and final year of studies, I tend not to give individual homework assignments. Rather, I prefer to give either group assignments or project-type assignments. Some of the projects deal with the afore-mentioned laboratory exercises or may involve some degree of analytical work. Regarding group assignments, my philosophy is for students to learn while discussing amongst themselves and for them to perhaps even debate about the correct approach to a problem. In some cases, one group member may get by with only a small effort. However, it is my belief that other, more industrious classmates will certainly not invite such an opportunistic student to join a future group assignment.

On at least a few occasions during the study time, a student should give a technical presentation in addition to a written work. At Aalto, this has taken the form of the presentation associated with the BS thesis, and again, with the MS thesis. Previously at Lappeenranta University of Technology (LUT), we had good success with students doing an individual project during their fourth year of study. In most cases, this takes the form of some type of analysis or development task associated with one of our laboratory research projects, or perhaps an industrial case that we have in-house. The International Institute of Welding (IIW), as part of its effort to verify fatigue analysis methods for welded structures, has had many computational round robin exercises. I have found that these make excellent individual projects where the student follows the IIW recommendations, conducts the analysis and then gives both an oral and a written report. The first oral report given by a student is rarely of good quality. Students also make a final presentation on their thesis projects and the presentations are often very clear and precise.

## 2. Teaching Experience

The majority of my pedagogical experience has been gained during the period 2001-2007 while at Lappeenranta University of Technology (LUT) and from 2008 to present at TKK/Aalto University. My major teaching responsibilities are for courses related to Dynamics, Structural Analysis, Fatigue, Design of Welded Joints, and Advanced Strength of Materials. The course *Dynamics I* is conducted in Finnish, while all other courses are in the English language.

## 2.1 Courses taught

*Dynamics I* is a large course which is taken by about 400 first year students each spring. Each week the course includes 2 hours of lectures, one hour for review (lecture format), one hour for investigating sample problems (handled by the lead-assistant), and 1 hour of help sessions at which all four course assistants are present and students are encouraged to ask questions about the homework sets. Students are assigned several calculation problems each week. Traditionally, these were returned in paper format, but since 2011, the electronic system [www.masteringengineering.com](http://www.masteringengineering.com) has become the preferred method.

*Structural Analysis* is a course for second year students (Bachelor's level). The course normally has usually consisted of 60-70 students per year. The main objective of the course is to help students apply some of the basic concepts from statics and strength of materials to simple beam, frame and truss type structures. For indeterminate structures, I teach simple approximate methods, Castigliano's methods, virtual work and force methods.

*Fatigue of Structures* is intended for students in their 4<sup>th</sup> or 5<sup>th</sup> year of studies (Master's Level). The course topics include the three primary fatigue analysis methods, i.e., stress-life, strain-life and fracture mechanics. In order to teach the strain life method, some simple concepts about the elastic-plastic behaviour must first be communicated. The course also deals with the influence of notches, variable amplitude loading, the variable nature of fatigue, etc..

The course *Design of Welded Structures* is taught in cooperation with the Laboratory of Engineering Materials at Aalto which is responsible for teaching and research in welding technology. The course is intended for students in their 4<sup>th</sup> or 5<sup>th</sup> year of studies (Master's Level). The course components which I cover generally relate to plate-type structures. Topics include, *inter alia*, limit state design, strength assessment of welds for predominantly static loading, residual distortion, and stresses due to welding and fatigue of welded joints.

The course *Advanced Strength of Materials* focuses on beam bending, states of stress and strain, stress-strain relationships, thick-walled axisymmetric structures, stress functions, elementary experimental methods in strength of materials, failure theories, St. Venant's theory for torsion, Prandtl membrane analogy, restrained warping of thin-walled open sections, elastic buckling, plastic bending and torsion, and plastic limit analysis.

## 2.2 Researcher training

I have taught a doctoral course on *Statistical Aspects of Fatigue and Fracture* at the Helsinki University of Technology, as well as the course *Fatigue of Materials and Structures* as part of the Finnish National Graduate School in Technical Mechanics. At Aalto, I have served as coordinator for two doctoral level courses, *Reliability Aspects in Design* (2010) and *Local Approaches for Avoiding Fatigue and Fracture* (2011). Guest lecturers for these courses were, Prof. Gregory Glinka (University of Waterloo, Ontario/Canada), Prof. Dr.-Ing. C.M. Sonsino (Fraunhofer Institute, Darmstadt/Germany), Prof. Andrzej Neimitz (Technical University of Kielce, Poland) and Dr. André Bignonnet (Peugeot-Citroën AS, Paris/France), are all part of my global network of contacts.

➤ Doctoral theses supervised:

- Juha Kilkki (2002) "Automated formulation of optimisation models for steel beam structures" – passed with honours
- Mika Bäckström (2003) "Multiaxial fatigue life assessment of welds based on nominal and hot spot stresses"
- Xiaoyan Li (2003) "Effect of mechanical and geometric mismatching on fatigue and damage of welded joints"
- Tapani Halme (2004) "Novel techniques and applications in generalized beam theory"
- Timo Björk (2005) "Ductility and ultimate strength of cold-formed rectangular hollow section joints at sub-zero temperatures" – passed with honours
- Veli-Matti Lihavainen (2006) "A novel approach for assessing the fatigue strength of ultrasonic impact treated welded structures"
- Ilkka Poutiainen (2006) "A modified structural stress method for fatigue assessment of welded structures"
- Ahti Oinonen (2011) "Damage modelling procedure and positioning optimization of adhesively-reinforced frictional interfaces" (Thesis defence scheduled for 2011)

➤ Four other full-time doctoral students are currently under my supervision.

➤ MS and T. Lic. theses:

- 58 MS and two T.Lic. theses during the period 2002-2010. Two other MS thesis students are currently under my supervision .

### 2.3 Adult and continuing education

In 2004, I was invited to chair a working group within the International Authorisation Board (IAB) of the International Institute of Welding (IIW). The goal of this working group was to develop an international curriculum for design engineers and designers of welded structures. The curriculum was presented at several IAB meetings and was approved for international use in January 2007. The course provides a total of 180 hours of training, divided into seven 3-day modules. The goals of the training are to provide:

- Basic training in weld processes, materials and equipment, to improve a designer's ability to create cost-effective and manufacturing-friendly designs.
- Information on relevant standards and nomenclature, to enable more precise communication between designer and fabricator, even if they are in different cities or countries.
- Up-to-date information for designers based on IIW design commissions' recommendations.
- Continuing education for BS level engineers or MS level engineers from other disciplines who need training in welded structure design.
- Improved technical ability for demanding design applications.

The intention was not for any single person to be qualified to teach all 180 hours of the course. Instead, the teaching work is divided among 10 or more instructors. My role was to coordinate the international effort to produce the curriculum that can be applied in

several countries. To date, numerous courses have been held in Finland and in six other countries.

## 2.4 Course materials

Course materials, including syllabus, lecture slides, sample examinations and exercises with solutions, are viewable on Aalto/Noppa for the courses I currently administer, i.e., Kul-49.1100 *Dynamics I*, Kul-49.4350 *Fatigue of Structures* and Kul-49.4300 *Fracture Mechanics*.

In preparing lecture slides, I generally try to avoid "busy slides", i.e., slides with large amounts of text, numerous bullet points or with long equations. I reproduce figures, graphs and pictures which are not easily reproduced by hand. I also provide titles and basic equations. During lectures, I focus on word descriptions which lead from one slide to the next. Students who do not attend lectures have occasionally complained that my slides are not as complete as "a text book". This, however, is done intentionally. Slides are available prior to the lecture and my goal is for students to take written notes to supplement the information on the slides. Students who skip all lectures and rely only on my slides would evidently encounter difficulty in following my courses. By contrast, I try to make published, solved example problems or examination solutions as clear and self-explanatory as possible.

## 2.5 Teaching assessment

Lappeenranta University of Technology (LUT) has been collecting course feedback from students since 2004. The average score for all mechanical engineering courses is 3.45 (Max. = 5.0). For the courses which I taught, the feedback scores were 4.05 for *Design of Steel Structures*, 4.32 for *Fatigue Design*, 3.62 for *Advanced Strength of Materials* and 3.70 for *Structural Analysis*. I received feedback for the first time at Aalto University only in spring 2011 for the course *Dynamics I*, and even then, from less than 10% of all registered students. It is therefore difficult to draw any valid conclusions.

## 3. Teaching Administration

During the time of my appointment as Professor of Steel Structures at LUT(2001-2008), I served as Head of the laboratory of fatigue and strength. The laboratory employed 16 full-time staff, plus six part-time and short-term workers. As laboratory Head, one major responsibility was to oversee all undergraduate and graduate courses related to solid mechanics and structural design. My tasks included organizing the timing and content of these courses, planning for new courses and making decisions about who would serve as primary lecturer and assistant(s). The list of undergraduate courses is extensive and includes *Statics*, *Dynamics*, *Basic Vibration Mechanics*, *Advanced Vibrations Mechanics*, *Basic Strength of Materials*, *Advanced Strength of Materials*, *Basics of Finite Element Analysis*, *Advanced Finite Element Analysis*, *Structural Analysis*, *Fatigue Design*, *Design of Steel Structures*, *Structural Optimisation*, *Rotor Dynamics*, *Plates and Shells*, and *Introduction to Materials Science*. Doctoral level courses and seminars tended to vary significantly from year to year, due to the relatively small number of graduate students in the department.

In 2009, I was appointed to serve as Chairman of Aalto's English Language Master's Degree programme in Mechanical Engineering. This programme is jointly administered by



the Department of Applied Mechanics and the Department of Mechanical Design and Production. In 2010, the programme was designated to participate in the Aalto University tuition trial programme for non-EU/EEA students. The programme has a steering committee which initially prepared the proposal for the Aalto Board of Directors and has since continued to develop the curriculum, its administration and the acceptance of new students. Sixteen foreign students have accepted study places in this programme and are expected to enrol in autumn 2011.

In 2010-2011, I served as the Professor representative from the Department of Applied Mechanics to the TEE project group for the degree programme in Mechanical Engineering.

## Research profile - Gary B Marquis

My interest in research and specifically in fatigue research started more than 20 years ago during my master's degrees studies at the University of Illinois. The emphasis of research during these years was on the fatigue of materials. My own research at the time was damage accumulation for simple variable amplitude loading during low cycle fatigue.

My most significant experience, at least in terms of years, was gained as a researcher at the VTT Technical Research Centre of Finland. Our unit specialised in the testing of materials and structures in service environments. In some cases this involved the development of sophisticated testing equipment for simulated nuclear environments of deep sea conditions.

My specific effort for many years was given primarily to the development and use of test systems for simulated spectrum loading. In those years testing software for spectrum fatigue testing was not readily available on the market and most of the programs used needed to be developed in-house. I used and developed these systems for crack growth rate and materials testing, testing of simple structures and testing of several more complicated structures.

During my time at VTT I developed a special interest in the problem of very long life spectrum loading. This was an area where industrial partners had numerous questions and relatively little test data was available. Most of the fatigue damage for this type loading spectrum is due to cycles with stress ranges smaller than the traditional endurance limit stress range. Thus, most textbook damage accumulation models cannot be used. My own doctoral thesis was for long-life spectrum fatigue of welded structures.

I continued to study the damage caused by irregular underload cycles on materials. Materials were normally commonly used structural materials for rotating or reciprocating machinery, i.e., cast irons, QT steels, low carbon steels, etc. Individual underload cycles, even if applied very rarely ( $1/300000$ ) are sufficient to destroy the endurance limit and completely alter the fatigue damage process. Generally this is an area where I hope to be able to continue some research.

The time as Professor of Steel Structures at LUT has broadened my research profile significantly. Due to the equipment in the laboratory, the staff and the profile of the laboratory in the eyes of Finnish industries and funding organisations, our laboratory focuses largely on the fatigue of fabricated structures. Materials are both stainless steels used in mechanical engineering structures and structural steels. Steel strengths are clearly increasing so that we now work extensively with steels having yield strengths above 600 MPa. Fatigue of fabricated structures has many facets which make the problem interesting. The geometries are normally complex which demands that the mechanics of the structure must be understood. Finite element analysis is a required tool, but cannot solve all problems. Instrumentation during testing is normally complicated as are test fixtures.

Another important point is that the variety of welded joint types continues the increase. Laser welding and hybrid laser welds allow joint configurations that were not possible even a few years ago. The trend toward increasing material strength means that

designs must be more precise and the link between design and manufacturing processes will grow.

The study of multiaxial fatigue continues to be a topic of interest. This includes both long-life multiaxial fatigue and mixed mode crack propagation. The role of fabrication induced residual stresses on mixed mode crack propagation is one of my current interests. Fabrication induced residual stresses may be due to cold-forming, thermal processes like welding, machining or impact treatments. Numerical modelling in the prediction of residual stresses and the connection between these predictions and design is also fertile ground for further study.

As chairman of the International Institute of Welding Commission on Fatigue of Welded Structures and over several years of involvement with that organisation, I have observed a number of trends can be listed which, in my view, will require international research attention during the next years:

- The choice of available structural materials and types of joints that can be manufactured is continually increasing
- The strength of materials used in structural applications is increasing as are the demands on structures
- Virtual design, including multibody simulation, FE analysis and numerical optimisation will have increased importance
- Sandwich-type structures will replace plate structures in some fatigue loaded structures
- Various forms of hybrid structures will be studied
- The prediction, influence, and control of residual stresses and deformations will need extensive effort

These research problems will not be solved by individual researchers, but, rather, they will require efforts by multi-technical research teams. In the course of several Nordic projects we have worked to develop what has been termed an integrated approach to research on future generations of welded structures. The most important aspect is that research in structural durability must be coordinated with materials research and advances in production engineering. The integrated research approach includes coordinated efforts in several key technologies: high-speed welding processes, high strength materials, cost-effective NDE, post-weld treatments and FE-based design assessment tools.

Throughout my career I have been primarily involved in experimental research. This I will expect to continue. The previous mentioned research activities will also rely heavily on numerical methods, expertise in materials modelling and knowledge of production technologies. In these areas I would expect to make use of existing domestic and international networks.

A list of recent national and international research activities is given in the CV.



KTH Teknikvetenskap

Till: Anders Forsgren

Stockholm 2012-02-06

**Utlåtande med anledning av att vi önskar få Mietek Bakowski som affilierad professor i gruppen för medicinsk bildfysik på KTH från 1 mars 2012 till 1 mars 2015.**

För närvarande är vårt största forskningsprojekt inriktat på att ta fram en ny sensorteknik för datortomografi, en av världens vanligaste medicinska undersökningar för diagnos och detektion av olika sjukdomstillstånd. Speciellt kan effektivare sensorer sänka stråldosen vid undersökning av små barn. En mycket viktig komponent är sensormaterialet och preparering av detta genom så kallad dopning. För att förutsäga signalen från varje röntgen interaktion måste vi känna till fältbild och påverkan från ytladdningar. Detta är mycket komplicerat och vi har idag inte inom vår grupp den yttersta spetskompetens på halvledarfysik som krävs för detta. Det är denna kompetens som Mietek Bacowski kommer att bidra med. Vi kommer speciellt att med experiment, beräkningar och simuleringar att studera effekter av strålning på detektormaterialet och hur det påverkar fältbilden.

Mats Danielsson



KTH Teknikvetenskap

bilaga 5

Till: Anders Forsgren

Stockholm 2012-02-06

#### Affilierad professor i gruppen medicinsk bildfysik

Skolstyrelse, ledningsgrupp, prefekt och ämnesföreträdare har informerats om vår önskan att affiliera Mietek Bacowski som professor i gruppen medicinsk bildfysik vid KTH. Skolan ställer arbetsplats och eventuell särskild utrustning till förfogande samt är införstådd med att arbetsmiljölagens regler gäller för den föreslagna kandidaten.

Mats Danielsson  
Ämnesföreträdare medicinsk bildfysik

Gustav Amberg  
Skolchef Teknikvetenskap

bilaga 5

Kista 2012-01-04

Jag känner mig hedrad och accepterar gärna att bli affilierad professor på KTH i Mats Danielssons grupp för medicinsk bildfysik.

A handwritten signature in black ink, appearing to read 'mietek Bakowski'.

Mietek Bakowski

## Curriculum Vitae

Mietek Bakowski was born in Bydgoszcz, Poland, in 1946. 1964-1969 he completed MSc studies at the faculty of Electronics at the Warsaw University of Technology, Warsaw. He left Poland 1969 and 1970 he joined the research and teaching staff of the Institution for Electron Physics III at Chalmers University of Technology, Gothenburg, Sweden, where he received the PhD degree in 1974 and the Assistant Professor competence in 1981. He participated in full spectrum of teaching activities at the department assuming responsibility for the laboratory exercises, theoretical exercises and teaching the course.

During his stay at the Chalmers University of Technology he worked with development and application of nondestructive electrical methods for characterisation of high voltage thyristors and MOS and MNOS devices. He also worked with development and application of 2D numerical methods for calculation of electric field and breakdown in high voltage thyristors and diodes.

At two occasions, 1975/76 and 1977/78 he stayed as a guest researcher at the Jet Propulsion Laboratory, Pasadena, California, USA where he worked with development and application of avalanche injection methods for studies of oxide reliability problems in MOS devices. For his work he was presented 1980 with a Certificate of Recognition by National Aeronautics and Space Administration, NASA.

In 1983 he joined the Semiconductor Development department at ASEA (later ASEA Drives and ABB Drives AB), Västerås, Sweden where he worked as semiconductor specialist until 1991 with development of power devices for motor drive applications. His activities included design, development and evaluation of GTO thyristors as well as research co-operation with Electronics Departments at Uppsala University and Chalmers University of Technology and with Swedish Institute of Microelectronics. The research co-operation concerned mainly the analysis of the devices under development and investigation of new types of power devices. He was project leader for GTO development projects and supervised a number of graduate works related to thyristor and GTO development.

In 1991 he joined the group of Power Semiconductor Devices at the Swedish Institute of Microelectronics, Kista, where he worked with development and evaluation of different BiMOS and bipolar power device concepts for motor drive and HVDC applications. He was project leader for the Fine Pattern GTO thyristor (so called Compact GTO) and the High Power Thyristor with MOSFET controlled shorts (MCSH) projects and participated in the high power MCT type thyristor development (QCT) project within joint ABB and NUTEK power device program 1991-1994.

Since 1994 he is with the Silicon Carbide Electronics group at the Industrial Microelectronics Center, Kista, (nowadays ACREO) working with the design, simulation and electrical evaluation of Silicon Carbide devices. He has been involved in design, fabrication and evaluation of SiC Schottky barrier and PiN rectifiers and radiation detectors and SiC JFETs and MOSFETs.

In 2000 he has been appointed Adjoint Professor at department of Solid State Physics (FTE) at KTH, Electrum, Kista (now MPS/IMIT), the position he held until 2003.

The main focus of research, development and teaching has been the physics of operation, design, technology, reliability and applications of power semiconductor and MOS devices. He is author and co-author of about 100 publications and 25 US patents.

He is Swedish citizen since 1976.

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## Lektor i kärnkraftsäkerhet

### Ämnesområde

Kärnkraftsäkerhet

### Ämnesbeskrivning

Ämnesområdet omfattar säkerhetsarbete kring existerande och framtida kärnkraftverk, i syfte att förebygga och begränsa reaktorolyckor, exempelvis härdsmläta. Forskningen är inriktad på förståelse av olycksfenomen genom experiment, modellering och numerisk simulering, samt analys av anläggningssäkerhet och hantering av allvarliga olyckor.

### Arbetsuppgifter

Den utvalde sökanden kommer att bidra till både forskning, undervisning/utbildning av studenter och relaterade administrativa uppgifter. Den sökande förväntas bidra till initiering av ny forskningsverksamhet, etablera nya samverkande forskningsnätverk, och skapa en ny kurs relaterad till säkerhetsanalys av lättvattenreaktorer.

### Behörighet

Behörig att anställas som lektor är den som dels har avlagt doktorsexamen eller har motsvarande vetenskaplig kompetens, eller har någon annan yrkesskicklighet som är av betydelse med hänsyn till anställningens ämnesinnehåll och de arbetsuppgifter som ska ingå i anställningen. Den sökande skall ha visat pedagogisk skicklighet. Som särskilda behörighetskrav gäller förmåga att söka och erhålla medel för och driva forskningsprojekt, samt förmåga att leda utbildnings- och forskningsverksamhet.

### Bedömningsgrunder

Lika stor omsorg kommer att ägnas prövningen av den vetenskapliga och den pedagogiska skickligheten. Särskild vikt kommer att läggas på vetenskaplig skicklighet dokumenterad genom artiklar publicerade i internationellt erkända tidskrifter och vetenskapligt granskade artiklar till konferenser inom ämnesområdet. Forskning inriktad mot allvarliga reaktorolycksfenomen, termohydraulik i reaktorsystem kyllda med vatten och flytande metall, samt förmåga att genomföra säkerhetsanalys av kärnkraftverk är speciellt meriterande. Stor vikt kommer även att läggas på förmågan att leda forskningsprojekt och att undervisa och handleda unga forskare (postdoktorer, doktorander och masterstudenter). Speciellt är flerårig erfarenhet av ledarskap av forskningsgrupp meriterande.



March 19, 2012

Dean  
School of Engineering Sciences  
KTH

### **'Lektor' in Nuclear Power Safety**

The Department of Physics proposes to establish a 'Lektor' position in Nuclear Power Safety. This position replaces the 'Bitr. Lektor' position held by Dr. Tomasz Kozłowski until his departure from KTH in November 2011. It is important for both the Department and KTH that Kozłowski's position is replaced with a 'Lektor' position in order to address the following needs:

- qualified supervisor of Master's and PhD students within Nuclear Power Safety;
- creation of a new course in safety analysis of light water reactors after the recent Fukushima accident;
- experienced leader of activities in a broad interdisciplinary research area including severe accidents, complex plant simulations, boiling heat transfer, etc.

The position will benefit both Nuclear Power Safety research and education as well as the national nuclear industry, which will receive qualified KTH graduates. Financial support for the 'Lektor' position breaks-down as follows during the next 5 years. Additional funding will come from faculty funds, if required.

<b>Sponsor</b>	<b>Budget (MSEK)</b>	<b>Comment</b>
SKC	0.35	6 year agreement
SSM	0.5	TSO-DSA agreement, 6 year agreement
ENSI	0.4	MSWI consortium, 5 year agreement
<b>Total</b>	<b>1.25</b>	

SKC: Svensk Kärntekniskt Centrum

SSM: Strålsäkerhetsmyndigheten

ENSI: Swiss Federal Nuclear Safety Inspectorate

A committee has been formed to prepare this application. The members are: Sevostian Bechta, Head of Nuclear Power Safety division; Mark Pearce, Head of Department; and Janne Wallenius, Head of Reactor Physics division (outside expert).

Sincerely,

Mark Pearce  
Head of Physics Department

Appendices:

- List of potential applicants

Bilaga 6



School of Engineering Sciences  
Department of Physics

- Description of position

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**List of potential applicants for the position of 'Lektor' in Nuclear Power Safety, Department of Physics.**

#	Name	Birth year	Gender	Year of PhD defense	Presently employed by	Contact details
1	Roberta Concilio Hansson	1972	F	2010	KTH	E-mail: rch@kth.se Phone: +46 [0] 8 5537 8823 Mobile: +46 [0] 73 084 2566
2	Weimin Ma	1968	M	1996	KTH	E-mail: ma@safety.sci.kth.se Tel: +46 (8) 5537 8821 Mobile: +46 [0] 73 788 3897
3	Walter Villanueva	1978	M	2007	KTH	E-mail: walterv@kth.se Tel: +46 (8) 5537 8826 Mobile: +46 [0] 76 049 8677
4	Xiaoyang Gaus-Liu	1975	F	2007	KIT	Email: xiaoyang.gaus-liu@kit.edu Tel: +49 7247 82-4889
5	Domenico Paladino	1977	M	2004	PSI	Email: domenico.paladino@psi.ch Tel: +41-56-3104373