

# Optik & fotonikdagarna 2011

## på Folkets Hus i Hudiksvall

### Preliminary Program

#### Day 1: Wednesday 16 November

Start	Stop	Time		ver.2011-10-18
9:00	10:00	1:00	Registration	
10:00	10:10	0:10	"Welcome speech", Magnus Buvall, CEO Fiber Optic Valley	
10:10	10:20	0:10	"Introduction speech", Fredrik Laurell, SOS and PhotonicSweden	
			<b>Session 1: Biotech, lasers and applications</b>	
10:20	10:40	0:20	"Lasers enabling biomedical research", Jonas Hellström, Cobolt AB	
10:40	11:00	0:20	"Lasers for Diabetes research", Anders Tengholm, UU,	
11:00	11:20	0:20	"Super resolution STED microscopy, a powerful tool for bioimaging", Daniel Rönnlund, KTH	
11:20	11:40	0:20	"Examples on and monitoring of Laser Micro Machining applications", Rickard Olsson, Laser Nova AB	
11:40	12:00	0:20	"Military laser research at FOI - history and future", Ove Steinvall, FOI,	
12:00	13:30	1:30	Lunch break + Exhibition & Posters	
			<b>Session 2: Industrial measurement techniques &amp; Optical methods within photonics</b>	
13:30	13:50	0:20	"Online Optical Measurement of Topography in Paper Machines", Jan Thim, MiUn	
13:50	14:10	0:20	"Road characterisation using absorption and scattering of polarized light", Johan Casselgren, LTU	
			"Products with built-in machine vision -Applications within virtual reality, automotive and robotics industry", Benny Thörnberg, MiUn	
14:10	14:30	0:20	"Capture for future 3DTV", Mårten Sjöström, MiUn	
			"IR high and low - airborne mapping of district heating pipe leakages and disease detection in the barn", Jörgen Ahlberg, Termisk Systemteknik,	
14:50	15:10	0:20		
15:10	15:40	0:30	Coffee break	
15:40	16:00	0:20	"Optical optimization of visual sensor network for eagle tracking", Najeem Lawal, MiUn	
16:00	16:20	0:20	"Optical techniques for true ground velocity measurement", Daniel Armyr, Optronic	
16:20	16:40	0:20	"Quantum memories - light-matter interfaces for storing quantum information", Stefan Kröll, LTH	
			<b>Session 3: Photonics community and awards</b>	
16:40	17:00	0:20	PhotonicSweden presentation	
17:00	17:10	0:10	Swedoptronics pris för bästa optikföretag och exjobb	
17:10	18:10	1:00	**** SOS Årsstämma-2011 **** & Exhibition & Posters	
18:10	19:00	0:50	Paus	
19:00	19:30	0:30	Drink at Folkets Hus	
19:30	23:59	4:29	Dinner at Folkets Hus	

#### Day 2: Thursday 17 November

Start	Stop	Time	
			<b>Session 4: Terminology and Sensor applications</b>
8:30	8:50	0:20	"The Swedish Optics Terminology Group. A presentation of our work", Sten Walles
8:50	9:10	0:20	"Polymer membrane based IR sensors for gas detection", Claes Mattsson, MiUn
9:10	9:30	0:20	"IR gas sensor optical design for high volume production in Delsbo, Sweden", Hans Martin, SenseAir AB
9:30	9:50	0:20	"High-precision boundary detection in OCT images", Peter Ekberg, Micronic Mydata AB
9:50	10:20	0:30	Coffee break + Exhibition & Posters
			<b>Session 5: Fiber optics and Fiber optic applications</b>
10:20	10:50	0:30	"Photonic crystal fibers for high power lasers", Jes Broeng, NKT Photonics A/S
10:50	11:10	0:20	"Development of a new disposable fiber optic sensor for monitoring of dialysis patients", Daniel Engvall, Redsense Medical AB
			"Dispersion compensation for next generation optical networks", Krister Fröjd, Proximion Fiber Systems AB
11:10	11:30	0:20	
11:30	11:50	0:20	"Micron size separation in microstructured fiber for biomedical studies", Aziza Sudirman, Acro AB
11:50	12:10	0:20	"Fiber optic applications in cancer therapy", Stephan Dymling, Clinical Laserthermia System AB
12:10	13:10	1:00	Lunch + Exhibition & Posters
13:10	13:30	0:20	PhotonicSweden-introduction of Work Groups
13:30	14:10	0:40	PhotonicSweden-startup for Work Groups
14:10	16:30	2:20	Company visit tour: Acro
			Company visit tour: Ericsson Cable
			Company visit tour: SenseAir
16:30	16:30	0:00	The End

***Speaker titles and abstracts at Optik och fotonikdagarna 2011***

## **Day 1, Wednesday 16/11**

### **Session 1, 10.00 – 12.00, Biotech, Lasers and applications**

**Jonas Hellström, Cobolt**

**Title:** Lasers enabling biomedical research,

**Authors:** Jonas Hellström, Elizabeth Illy, Håkan Karlsson

**Abstract:** The talk will give an overview of common biomedical applications where lasers play an important role. The talk will cover techniques based on Laser Induced Fluorescence, Raman spectroscopy and also discuss Optical Tweezers.

**Anders Tengholm, Uppsala universitet**, Lasers for Diabetes research.

**Daniel Rönnlund**, PhD student Applied Physics, Experimental Biomolecular Physics, Royal Institute of Technology, Stockholm-Sweden.

**Title:** Super resolution STED microscopy, a powerful tool for bioimaging

**Abstract:** Stimulated Emission Depletion (STED) microscopy is a novel method in the field of super resolution fluorescence imaging. The resolution in STED microscopy goes beyond the diffraction barrier by the addition of a second laser beam that stimulates excited fluorescent molecules outside the very center of the excitation focus back to the ground state [1]. This effectively reduces the volume from which fluorescence is detected and thus increases the resolution in the images without the need of any computer processing. In our lab, resolutions of 40 nm are achieved for two separate fluorophores simultaneously allowing us to study protein localization in cells such as growth hormone receptors in breast cancer tissue, angiogenesis controlling proteins in thrombocytes, sodium potassium pump and dopamine receptors in neurons [2,3] and adhesion and cytoskeletal proteins in transfected fibroblasts.

**Rickard Olsson, Lasernova AB**

**Title:** "Examples on and monitoring of Laser Micro Machining applications"

**Abstract:** Why? Who? When? What's next? Important parameters and examples of applications.

**Ove Steinvall, FOI - Swedish Defence Research Agency**

**Title:** "Military laser research at FOI -- history and future"

### **Session 2, 13.30 – 15.10, Industrial measurement techniques, Optical methods within photonics.**

**Dr. Jan Thim, Mid Sweden University,**

**Title:** Online Optical Measurement of Topography in Paper Machines

**Abstract:** Guaranteeing the surface quality for printing is today a key parameter for paper and paperboard manufacturers. It is no longer enough for the paper industry to, as is done today, have one single measurement on one

### ***Speaker titles and abstracts at Optik och fotonikdagarna 2011***

position characterizing a whole paper reel, weighing roughly 25 metric tons and costing about 200.000 sek. The solution would be to have an online measuring device of surface topography in the paper machine, measuring on every square meter of the reel. The question is: how do you measure micro structural topography of a surface moving at velocities up to 1500 m/min?

#### **Dr. Johan Casselgren, Luleå University of Technology**

**Title:** Road characterisation using absorption and scattering of polarized light

**Abstract:** The most dangerous road conditions are the ones that are difficult for the driver to detect. A sensor that can automatically classify the road condition could thereby improve road safety significantly. A new technique for classifying and describing various road conditions using absorption and scattering of polarized light has been developed and will be presented.

#### **Benny Thörnberg, Mid Sweden University**

**Title:** Products with built-in machine vision -Applications within virtual reality, automotive and robotics industry

**Abstract:** We see more of products emerging into our everyday life that have built-in video cameras combined with computational resources. These cameras are used as intelligent sensors for optical contactless measurements. Intelligent optical sensors are taught by engineers to recognize road- and street signs, measure position and orientation or we can even use them for machine-human interaction.

#### **Mårten Sjöström, Mid Sweden University**

**Title:** Capture for future 3DTV

**Abstract:** Future 3DTV will not require special spectacles and will imply a look-around capability by changing observer angle. Many perspectives must then be presented simultaneously in order to give a life-like appearance. A way to record such 3-D material is to use many cameras that capture the scene from different angles. Alternative capture technologies use fewer cameras, and possibly also cameras to register the distance to the different part of the scene. These technologies simplify capture and the data use less memory space. However, fewer perspectives require advanced methods to compute intermediate perspectives.

#### **Jörgen Ahlberg, Termisk Systemteknik,**

**Title:** "IR high and low - airborne mapping of district heating pipe leakages and disease detection in the barn"

**Abstract:** Termisk Systemteknik develops solutions for thermal imaging in various applications, of which two will be described in this presentation. The first is airborne control of district heating pipe systems, where leakages are detected by their influence on ground surface temperature. Termisk Systemteknik has performed a number of such controls in Scandinavia, and developed methods for automatic image analysis and leakage detection. The second is the detection of inflammatory diseases like mastitis in the udders of dairy cattle, where thermal cameras observe the cattle in conjunction with automatic milking systems.

### ***Speaker titles and abstracts at Optik och fotonikdagarna 2011***

## **Coffee break, 15.10 – 15.40**

### **Najeem Lawal, Mid Sweden University**

**Title:** "Optical optimization of visual sensor network for eagle tracking"

**Abstract:** Visual Sensor Networks (VSNs) are networks which consist of a number of cameras that generate two dimensional data. In our research we are developing models of the physical parameters of a visual sensor network to track large birds, such as Golden Eagle, in the sky. The research involves modeling the sky, behavior of the eagle, coverage model between any two altitude above a proposed geographical area and modeling the optical and placement properties of the vision systems. Our objective in this research is to minimize the number of vision nodes for any given geographical area, to achieve 100% coverage of the area for the given range of altitude and to be able to detect and track all eagles that come into the area.

### **Daniel Armyr, Optronic**

**Title:** Optical techniques for true ground velocity measurement

**Abstract:** The vehicle velocity is an important parameter that is used in a variety of vehicle applications. Nowadays in most cases, it is referred to the speed derived from the rotation speed of the transmission shaft or the wheels. By measuring the true ground velocity the accuracy of the safety applications could be increased e.g. Anti-lock Braking System (ABS), Electronic Stability Control (ESC) and Adaptive Cruise Control (ACC). Some optical techniques to measure velocity will be presented together with test results from the lab and field tests.

### **Stefan Kröll, Lund**

**Title:** Quantum memories - light-matter interfaces for storing quantum information

**Abstract:** Med sin bandbredd och utbredningshastighet är ljus ett fantastiskt medel för överföring av information. Med dagens teknologitveckling mot en ständigt ökande miniatyrisering ökar behovet av att kontrollera system ända ner på den kvantmekaniska nivå och samtidigt ökar också möjligheterna att utnyttja kvantmekaniska effekter för att bearbeta och hantera information. Den kvantmekaniska världen erbjuder resurser såsom superposition och sammanflätning vilka inte existerar för klassisk informationsbehandling och informationsöverföring och detta skapar nya möjligheter för hur vi kan använda och bearbeta information, (t ex kvantteleportation). Fotoner är inte bara utmärkta för klassisk informationsöverföring utan de är även det bästa kommunikationsmedel vi känner till för att kommunicera icke-klassisk information. Att överföra information är ett viktigt steg men det måste också vara möjligt att lagra den. Förslagsvis skulle föredraget framför allt handla om optiska minnen för att lagra kvantmekaniskt kodad information, s k kvantminnen.

***Speaker titles and abstracts at Optik och fotonikdagarna 2011***

## **Session 3, 16.40 – 17.10, Photonics community and awards**

PhotonicSweden – A Swedish national photonics platform

Swedoptronics price 2010 for the best optronics company and the best M.Sc. theses.

## **Day 2, Thursday 17/11**

### **Session 4, 08.30 – 09.50**

#### **Sten Walles (Presentation will be in Swedish)**

**Title:** "The Swedish Optics Terminology Group. A presentation of our work."

**Abstract:** The Swedish Optics Terminology Group was formed in 1996 as a working group within The Swedish Optical Society and soon developed into a permanent committee. The talk defines the concepts of 'Domain Loss' and 'The Third Task', which form an important background for our work. Our methods are explained in some detail. Finally, the way of presentation and filing of our results, and the financing and manning of our group, are outlined.

#### **Dr. Claes Mattsson, Mid Sweden University**

**Title:** Polymer membrane based IR sensors for gas detection

**Abstract:** A well established method used for detection of the concentration gases in an air atmosphere is the non-dispersive infrared technique. The method is simple and utilizes the property of infrared absorption seen in gases such as CO<sub>2</sub>. The natural detector choice in these systems is a membrane based thermopile detector. The membrane and the infrared absorption layer are important components in these types of detectors. Materials such as silicon and silicon nitride have commonly been used as membranes. In presented work the use of a thin polymer membrane with low thermal conductivity with integrated infrared absorber is demonstrated and discussed.

#### **Hans Martin, SenseAir, Delsbo.**

**Title:** IR gas sensor optical design for high volume production in Delsbo, Sweden

**Abstract:** Non-Dispersive Infra-Red gas sensing technology is traditionally based on some precision mechanical bench, housing a number of different expensive optical components that have to be manually aligned during production. During the past twenty years low-cost designs have emerged, where the mechanical and optical parts have been integrated by metallized injection molded polymer solutions. For meeting the future needs of many millions of sensors in production capacity per year, at even lower costs, further evolution is required; both on the opto-mechanics as well as on the electro-optic components packaging, in order to simplify fully automated assembly and calibration production lines.

### ***Speaker titles and abstracts at Optik och fotonikdagarna 2011***

#### **Peter Ekberg, Micronic Laser Systems AB**

**Title:** High-precision boundary detection in OCT images.

**Abstract:** An automated image processing algorithm for handling of Optical Coherence Tomography (OCT) images has been developed for measurements of multi layered materials of advanced ceramics. We avoid filtering and preset models for measuring of features as layer boundaries and channels in the material with sub-pixel accuracy. We have verified robustness of the algorithm using images from different OCT systems and extracted boundaries with local SNRs down to 0.9 dB.

## **Coffee break, 09.50 – 10.20**

## **Session 5, 10.20 – 12.10, Fiber Optics and Fiber Optic Applications,**

#### **Jes Broeng, NKT Photonics A/S**

**Title:** Photonic crystal fibers for high power lasers

**Abstract:**

#### **Daniel Engvall, Redsence Medical AB**

**Title:** Dispersion compensation for next generation optical networks

**Abstract:** Redsence Medical has in cooperation with Fiber optic Valley developed a new disposable sensor that reduces our production cost significantly with improved safety and effectiveness. Fiber optic valley was contacted already during the pre study phase of the project. The new sensor can be manufactured fully automatically and manufacturing methods was also a part of the project. Time from project start to release on the market will be approximately 12 months.

#### **Krister Fröjd, Proximion Fiber Systems AB**

**Title:** Dispersion compensation for next generation optical networks

**Abstract:**

#### **Aziza Sudirman, Acreo AB**

**Title:** Micron size separation in microstructured fiber for biomedical studies

**Abstract:** We introduce a technology based on laser-induced fluorescence detection for micron-size sorting and separation in microstructured fiber for biomedical studies. The use of microstructured fiber allows for manipulation and handling of single micron-size samples, such as beads, bacteria and small cells. The main advantage of a fiber-based analysis system over lab-on-a-chip is the potential for real time in-vivo monitoring and continuous sample measurements.

#### **Stephan Dymling, Clinical Laserthermia System AB**

**Title:** Fiber optic applications in cancer therapy

**Abstract:**

## Anmälningsavgifter till Optik och fotonikdagar 2011 i Hudiksvall

**Konferensavgift 2 dagar 16 och 17 november inkl moms  
inkl 3x kaffe, 2x lunch och 1x middag & dryck**

- |  |                       |
|--|-----------------------|
| 1. SOS/Swedoptronics/PhotonicSweden-Medlemmar: | SEK 1.500:- inkl moms |
| 2. Icke medlemmar                              | SEK 2.700:- inkl moms |

**Utställaravgift 16 och 17 november exkl moms  
inkl 1 person (3x kaffe, 2x lunch och 1x middag)**

- |  |                       |
|--|-----------------------|
| 3. SOS/Swedoptronics/PhotonicSweden-Medlemmar<br>Grön utställaryta:                  | SEK 7.800:- exkl moms |
| 4. SOS/Swedoptronics/PhotonicSweden-Medlemmar<br>Blå eller Röd utställaryta:         | SEK 6.500:- exkl moms |
| 5. Medföljande utställarkollega, 1 person<br>inkl (3x kaffe, 2x lunch och 1x middag) | SEK 1.200:- exkl moms |
| 6. Icke medlemmar<br>Grön utställaryta:  | SEK 9.800:- exkl moms |
| 7. Icke medlemmar<br>Blå eller Röd utställaryta:                                     | SEK 8.500:- exkl moms |
| 8. Medföljande utställarkollega, 1 person<br>inkl (3x kaffe, 2x lunch och 1x middag) | SEK 2.160:- exkl moms |

**Förnya eller nytt SOS-medlemskap för 2011 (ger konferensrabatt)**

- |     |   |             |
|-----|---|-------------|
| 9.  | Ordinarie personligt medlemskap<br>inkl EOS-medlemskap: | SEK 350:-   |
| 10. | Studentmedlemskap(ej EOS):                              | SEK 110:-   |
| 11. | Företagsmedlemskap (>6st personer):                     | SEK 3.450:- |
| 12. | Företagsmedlemskap (<=6st personer):                    | SEK 1.300:- |

### Hotellbokning

Över 100st hotellrum är **förbokade t.o.m. fredag 2011-10-14** på 3 olika hotell i Hudiksvall. (se bifogad lista). Hotellrum bokas av respektive deltagare.

**OBS! Anmälan mejlas till: [pia.mattsson@biox.kth.se](mailto:pia.mattsson@biox.kth.se)**

## Anmälan

Fyll i lämplig tabell och skicka till SOS-kansli per e-mail till Pia Mattson [pia.mattsson@biox.kth.se](mailto:pia.mattsson@biox.kth.se). Därefter genereras en faktura utifrån anmälan som returneras till avsändaren.

**Jag anmäler mig härmed som konferensdeltagare till *Optik och fotonikdagar 2011* i Hudiksvall 16-17 november. Fyll i lämpligt val i högra kolumnen:**

Ny SOS-medlem (?)	<input checked="" type="checkbox"/>		
Förnamn:	<input checked="" type="checkbox"/>		
Efternamn:	<input checked="" type="checkbox"/>		
SOS-medlemsnr. 2011 (?)	<input checked="" type="checkbox"/>		
Företag/Akademi/Privat:	<input checked="" type="checkbox"/>		
Adress:	<input checked="" type="checkbox"/>		
Postnr:	<input checked="" type="checkbox"/>		
E-mail adress:	<input checked="" type="checkbox"/>		
Ev. Web:	www.		
Konferensavgift alt.nr:	1-2:	SEK <input checked="" type="checkbox"/>	:-
Medlemsavgift 2011 alt.nr:	9-10	SEK <input checked="" type="checkbox"/>	:-
Specialmat?	<input checked="" type="checkbox"/>		
Önskar presentera poster:	(gratis)		

**Jag anmäler mig härmed som talare till *Optik och fotonikdagar 2011* i Hudiksvall 16-17 november. Fyll i lämpligt val i högra kolumnen:**

SOS-medlemsnr. 2011 (?)	<input checked="" type="checkbox"/>		
Förnamn:	<input checked="" type="checkbox"/>		
Efternamn:	<input checked="" type="checkbox"/>		
E-mail adress:	<input checked="" type="checkbox"/>		
Jag deltar följande dagar:	Dag 1: <input checked="" type="checkbox"/> Ja/Nej	Middag: <input checked="" type="checkbox"/> Ja/Nej	Dag 2: <input checked="" type="checkbox"/> Ja/Nej
Specialmat?			

**Jag anmäler mig härmed som utställare till *Optik och fotonikdagar 2011* i Hudiksvall 16-17 november. Fyll i lämpligt val i högra kolumnen:**

Ny SOS-medlem:	<input checked="" type="checkbox"/>		
Ny Swedoptronics-medlem:	<input checked="" type="checkbox"/>		
Ny PhotonicSweden-medlem	<input checked="" type="checkbox"/>		
Förnamn:	<input checked="" type="checkbox"/>		
Efternamn:	<input checked="" type="checkbox"/>		
SOS-medlemsnr. 2011:	<input checked="" type="checkbox"/>		
Swedoptronics medlem 2011:	<input checked="" type="checkbox"/>		
Företag/Akademi:	<input checked="" type="checkbox"/>		
Fakturareferens:	<input checked="" type="checkbox"/>		
Adress:	<input checked="" type="checkbox"/>		
Postnr:	<input checked="" type="checkbox"/>		
Telefonnr:	<input checked="" type="checkbox"/>		
E-mail adress:	<input checked="" type="checkbox"/>		
www	www.		
Utställaravgift alt.nr :	3,4,6 eller 7	SEK <input checked="" type="checkbox"/>	:-
SOS-Företagsmedlemskap 2011:	11-12	SEK <input checked="" type="checkbox"/>	:-

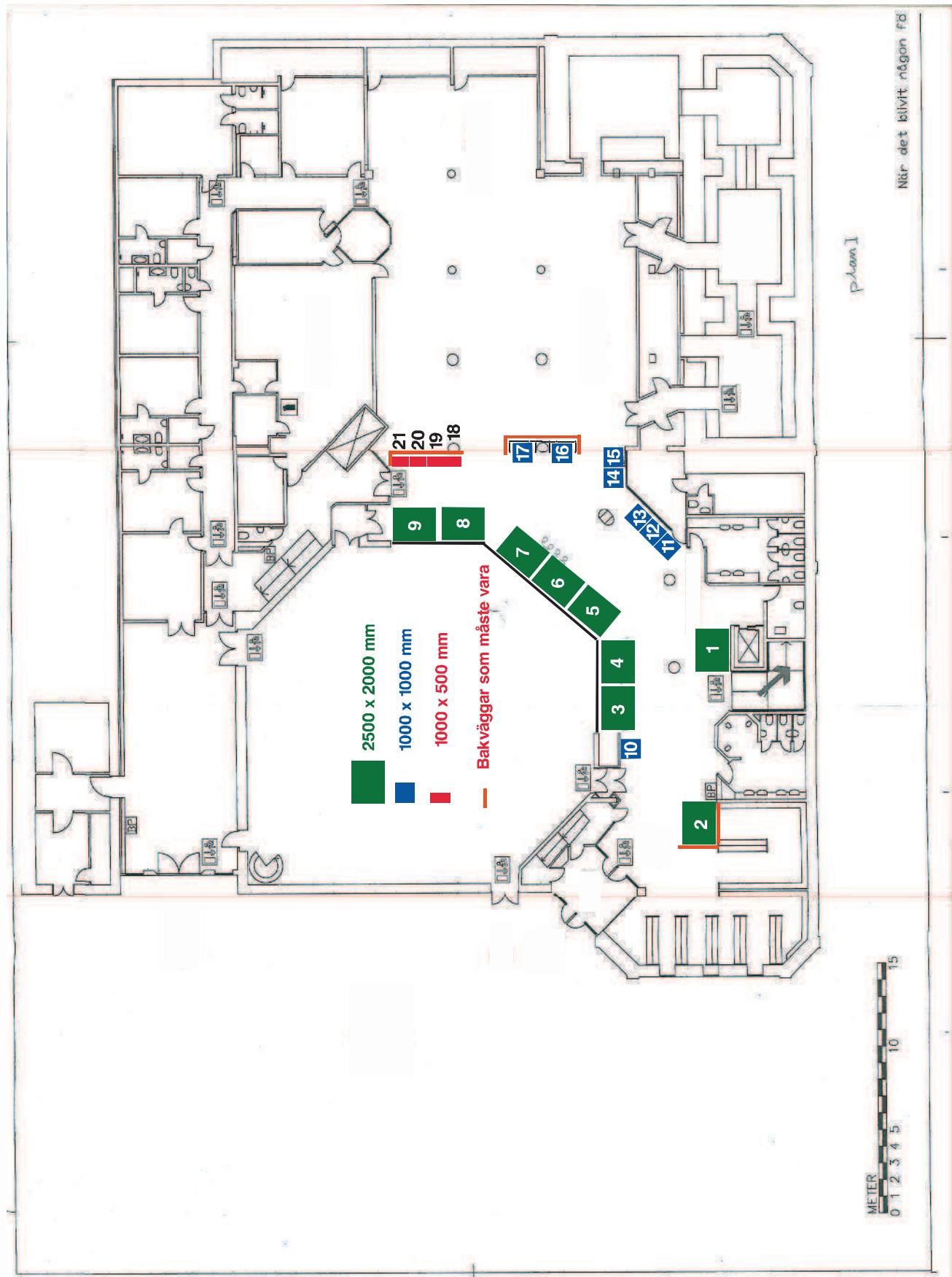
**Medföljande utställarkollegor:**

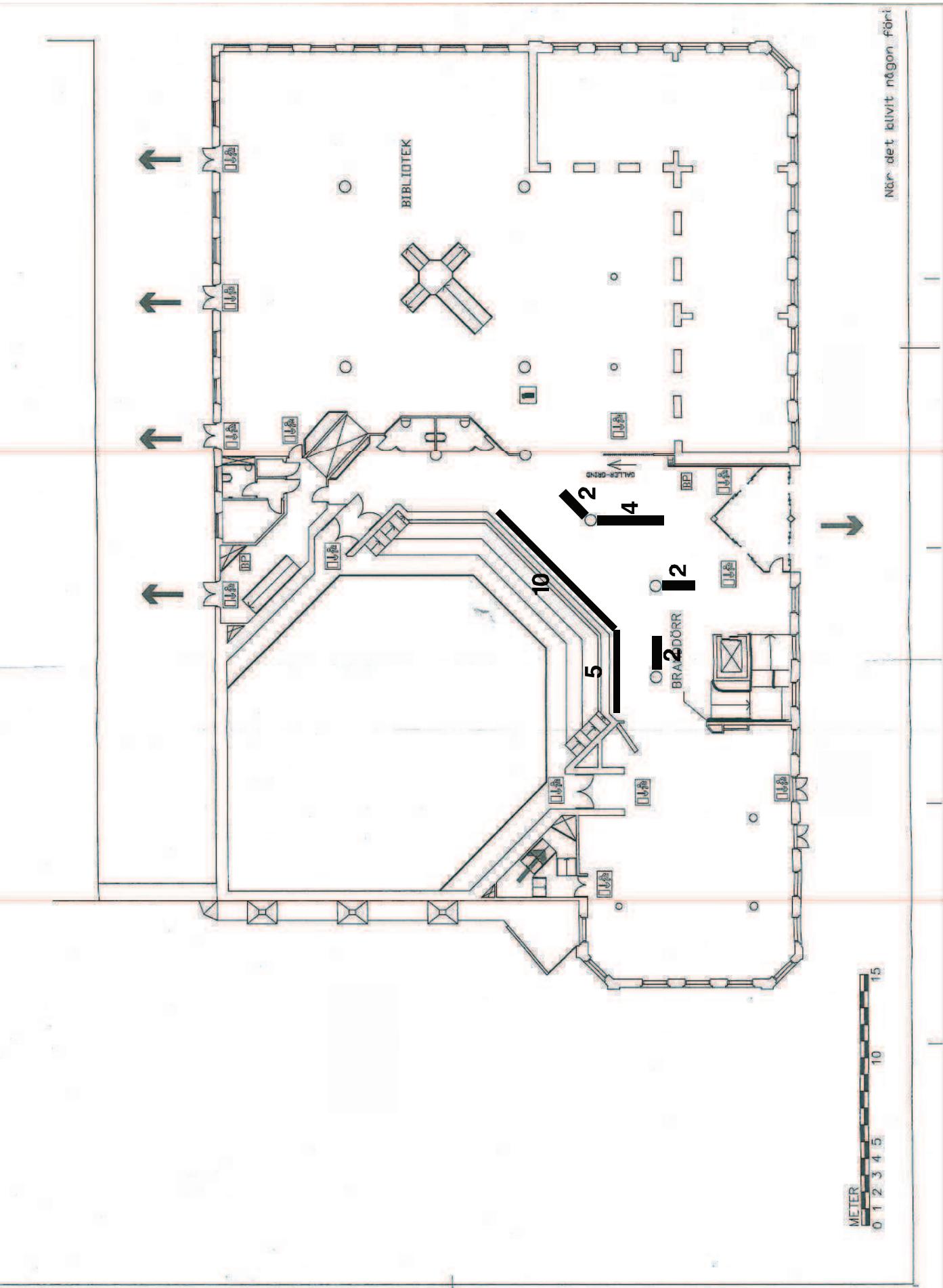
Namn:	<input checked="" type="checkbox"/>	SEK <input checked="" type="checkbox"/>	:-
Namn:	<input checked="" type="checkbox"/>	SEK <input checked="" type="checkbox"/>	:-
Namn:	<input checked="" type="checkbox"/>	SEK <input checked="" type="checkbox"/>	:-
Namn:	<input checked="" type="checkbox"/>	SEK <input checked="" type="checkbox"/>	:-
Namn:	<input checked="" type="checkbox"/>	SEK <input checked="" type="checkbox"/>	:-
Specialmat?	<input checked="" type="checkbox"/>		

**OBS! Sista anmälndag 2011-10-30.**

Ifyllt vald tabell skickas till [pia.mattsson@biox.kth.se](mailto:pia.mattsson@biox.kth.se). Anmälan är bindande.

**Fakturering sker i efterhand med sista betalningsdag 2010-11-15.**





## List of Hotels

### First Hotell Statt

(Pre-booked rooms until 2011-10-10, "Fiber Optic Valley".)

STORGATAN 36  
824 22 HUDIKSVALL SWEDEN  
Office: +46 (0) 650-150 60  
Fax: +46 (0) 650-960 95  
E-mail: [STATTHUDIKSVALL@FIRSTHOTELS.SE](mailto:STATTHUDIKSVALL@FIRSTHOTELS.SE)  
Rooms/Beds: 106/200  
Single room **SEK 1070**, Double room **SEK 1270**

### Best Western Hotell Hudik

(Pre-booked rooms until 2011-10-10, "Fiber Optic Valley".)

Norra Kyrkogatan 11  
824 30 Hudiksvall  
Tel: +46 (0)650-54 10 00  
Fax: +46 (0)650-54 10 10  
E-mail: [info@hotellhudik.se](mailto:info@hotellhudik.se)  
Rooms/Beds: 52/78  
Single room standard: **SEK 896**, Double room standard: **SEK 1121**  
Single room business: **SEK 1046**. Double room business: **SEK 1196**

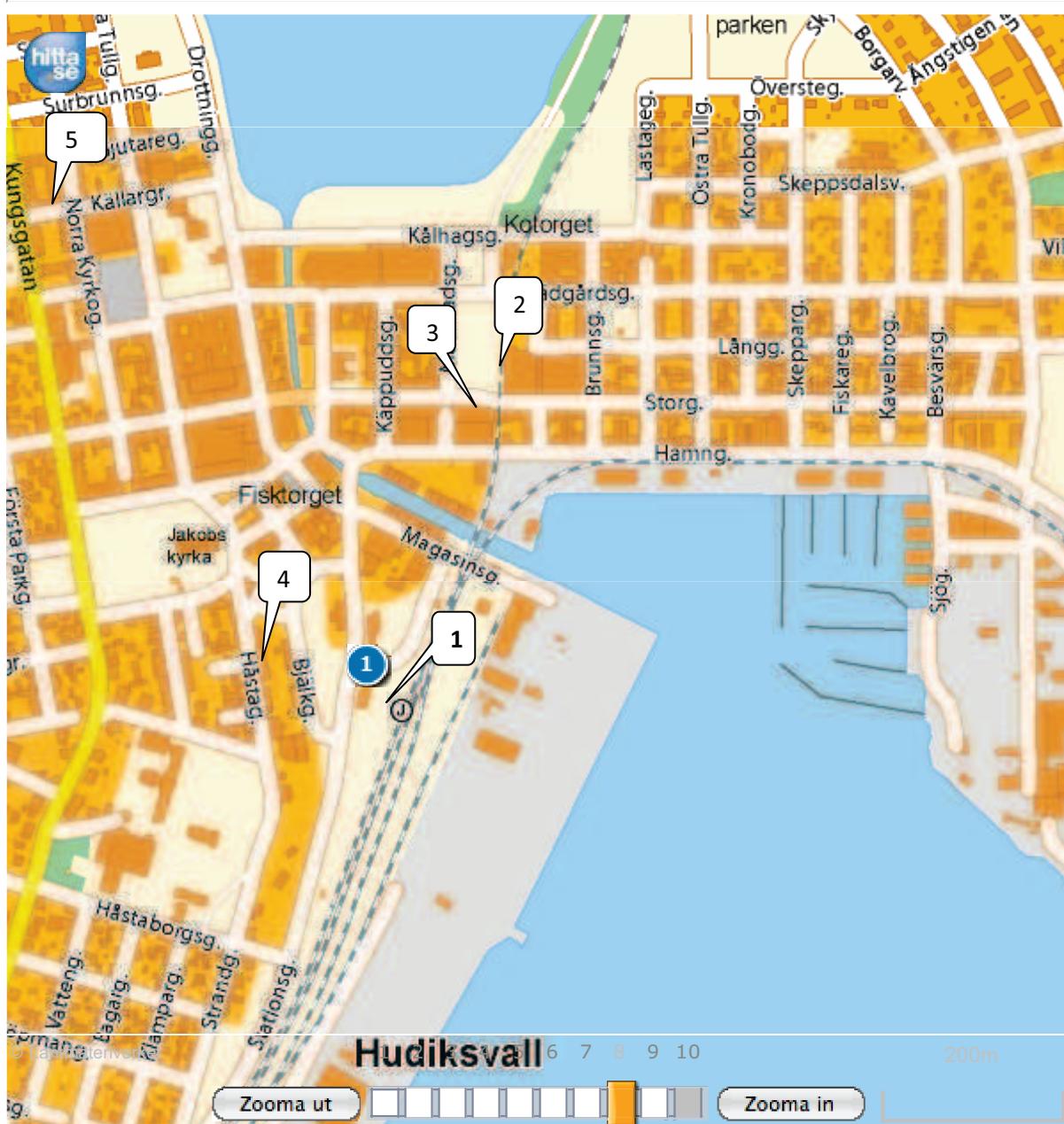
### Hotell Temperance

(Pre-booked rooms until 2011-10-10, "Fiber Optic Valley".)

Håstagatan 16  
824 43 Hudiksvall  
Phone: +46 (0) 650 - 31 107  
E-mail: [info@hotelltemperance.se](mailto:info@hotelltemperance.se)  
Rooms/Beds: 6/8  
Single room **SEK 820**, Double room **SEK 1020**

Hotell bokar var och en för sig.

## Karta



1. Järnvägsstationen
2. Folkets Hus
3. First Hotell Statt
4. Hotel Temperance
5. Hotel Hudik