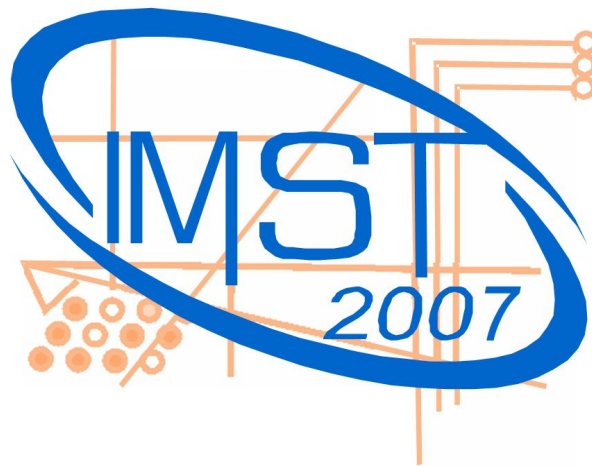


IMST2007
ENSCHEDÉ
THE NETHERLANDS
JUNE 18, 19, 20

Innovative Mass Storage Technologies
2007



Conference Guide

Dear Delegates

Welcome to Enschede! We are happy to host the IMST2007 for the first time in the Netherlands. Starting in 2001 in Grenoble, concurrent with Minatec, the IMST has traveled every other year out of France. first in Exeter (UK), than in Aachen (D).

The IMST brings together academic and industrial researchers in the field of mass data storage, regardless whether their background is in magnetic recording, optical or solid state data data storage. In this sense the conference is unique, not only will you get up to date with the latest developments in your area of data storage, you will also get an excellent opportunity to learn what the “competition” is doing.

One of the main aims of the conference is to bring together researchers from academia and industry, and try to form consortia for European project proposals. Therefore IMST is aimed at European researchers, but we are always extremely happy to welcome visitors from outside Europe, specifically Asia and the United States.

The program committee, chaired by Manfred Albrecht and Yves Samson, has put together an exiting list of oral and poster contributions. The program consists of a wide and very multidisciplinary range of topics, ranging from macromolecular storage to hard disks as logic devices, and vacancies in phase change materials to two stage MEMS slider actuators.

In recent years we have witnessed the introduction of new architectures, such as probe storage and Flash hard drives. Therefore the system aspects of mass storage systems and their relation with the overall computer architecture is becoming more important. The IMST organizing committee has decided to try to incorporate these communities. As a first step, this IMST will feature a small tutorial session on system aspects, sponsored by the EU ProTeM project. You will read more about this in this booklet.

The local organizing committee has tried hard to make your stay in Enschede as pleasant as possible. Rather than on the campus of the University of Twente, we choose the conference location is in the center of the small, but active, town of Enschede. Most hotel accommodations are close-by, and you can reach almost everything by foot. The city center has a wide range of restaurants and is famous (in the Netherlands) for its plenitude of bars. In this booklet you will find all necessary information, including a list of restaurants with special actions for IMST participants.

If, by any unforeseen mishap, your stay is not as pleasant as we expect, please do not hesitate to contact the local organization. But we sincerely hope you will remember IMST2007 as an interesting, and agreeable conference.

*Welkom in Enschede*¹

Leon Abelmann

1 See, Dutch is not so difficult!

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Monday 18th of June

Registration

15:30-17:00 Registration and coffee

Tutorial Program

17:00-19:00 Tutorial Session on System Aspects (sponsored by ProTeM*)

Abu Sebastian, IBM Zurich, CH, "Tutorial on positioning" (invited)

Oleg Zaboronski, Arithmatica, UK, "Tutorial on coding" (invited)

Sape Mullender, Bell Labs, USA, "Tutorial on filesystems" (invited)

*[ProTeM](#) is the Probe-based Terabit Memory project

The IMST is traditionally a conference which is visited by material scientists and physicists. In recent years we have noticed however that system aspects become more and more integrated with the design of mass storage systems, and can no longer be treated separately. An excellent example are the developments in the area of probe based data storage which uses of thousands of probes in parallel, and XY rather than rotating data access. Concepts which have been used for decades cannot be applied anymore, or are no longer efficient. This has become very clear in the recently started EU ProTeM project, in which probe based storage for archiving purposes is investigated.

Many new problems which arise (overwrite, wear, stability) do not necessarily have to be solved on the medium level. Sometimes it is far more easy to address these problems on the system level. On the other hand, problems on the system level (security, concurrency, power consumption) can sometimes be very easily solved on the medium or positioning levels. Treating the complete mass storage system, from medium to file system, as a whole has a big advantage. In this case we could talk about hardware/software co-design.

This does not mean that all researchers working in the field of mass data storage need to become experts in all fields. But some sort of basic knowledge is required for all involved. Therefore the IMST organizing committee and the ProTeM network have decided to organise a tutorial session, introducing system aspects of mass data storage to the general IMST audience.

The tutorial will take place on Monday evening, just before dinner, and has three excellent teachers who will treat

- Positioning and control (Abu Sebastian, IBM Zurich)
- Data detection and coding (Oleg Zaboronski, Arithmatica UK)
- System architecture and file systems (Sape Mullender, Bell Labs, USA)

All speakers will discuss the state-of-the art in their field, mainly in magnetic hard disk recording, and discuss the implications of new architectures such as probe storage.

The tutorial session is part of, and sponsored by, the ProTeM training program

Workshop Program

Tuesday 19th of June

7:30 – 8:15 Registration and coffee

8:15 – 8:30 Welcome by local chairman Dr. ir. Leon Abelmann and Scientific Director of MESA+ Prof. dr. ing. Dave H.A. Blank

**8:30 – 10:30 Morning I: Emerging and Future Technologies
Chair: David Wright, University of Exeter**

H. Richter, Thomson Villingen, GER
“Application & Technology Trends in Optical Storage” **(invited)**

S. Parkin, IBM Almaden RC, USA
“The Magnetic Racetrack Memory: a novel spintronic device based on current induced precessional motion of domain walls” **(invited)**

Haris Pozidis, IBM Zurich Laboratories, CH
“Scanning-probe-based Data Storage” **(invited)**

10:30-11:00 Coffee break

**11:00-12:15 Morning II: Future and Emerging Technologies / Magnetic Recording
Chair: Yves Samson, CEA Grenoble**

Dorothea Wiesman, IBM
“Ultra-high Storage Densities with Thermo-Mechanical Probes and Polymer Media” **(invited)**

L. Abelmann et al., University of Twente
“Scanning probe array memory research at the university of Twente”

J.B.C. Engelen et al., University of Twente
“Anomalous hall effect measurements on a nanosized CoPt dot array”

M. C. Hickey et al., University of Leeds
“Domain walls compressed by shape anisotropy in magnetic nanoconstrictions”

12:15-14:00 Lunch

**14:00-15:15 Afternoon I: Magnetic Recording
Chair: Manfred Albrecht, University of Konstanz**

T. Schrefl, University of Sheffield, GB
“Micromagnetic simulations on magnetic recording” **(invited)**

M. Asbahi, et al., SPINTEC
“Recording performances onto nano-imprinted pre-patterned perpendicular magnetic media”

R. Luttge et al., University of Twente
“Nanolithography for patterned magnetic data storage media”

T.C. Ulbrich et al., University of Konstanz
“Magnetic films on nanospheres: Realization of tilted media”

15:15-18:00 Poster Session (with soft drinks)

18:30- Conference Dinner

Wednesday 20th of June

8:00-8:30 Coffee

8:30 – 10:15 Morning I: Optical Storage / Future and Emerging Technologies Chair: Bernard Bechevet, CEA Grenoble
M. Mansuripur, Univ. Tucson, USA "Information Storage and Retrieval using Macro-molecules as Storage Media" (invited)
J. Om, Hynix Semiconductor Inc, "Scaling Issues in NAND FLASH Memory" (invited)
K. Curtis, InPhase Technologies, USA "Holographic drive and media developments at InPhase" (invited)
A.S. Matharu et al., University of York "Novel azothiophene polyesters for holographic storage"

10:15-10:45 Coffee break

10:45-12:15 Morning II: Phase Change / Solid State Memories Chair: Matthias Wuttig, RWTH Aachen
D. Keitel (Qimonda, GER) "Data security in memory systems and solutions" (invited)
R. Pandian et al., University of Groningen "Phase-change and electrolytic switching in chalcogenide thin films"
J. Gutwirth et al., University of Pardubice, Czech Republic "RF magnetron sputtered Ge ₂ Sb ₂ Te ₅ thin film characterization"
F. Merget et al, RWTH Aachen University "Conduction mechanisms of amorphous and crystalline Ge ₂ Sb ₂ Te ₅ at low temperatures"
C.D. Wright et al., University of Exeter "Understanding multi-state phase-change memories and processors"

12:15-14:00 Lunch

14:00-16:00 Afternoon I: Phase Change /Solid State Memories / Others Chair: Doris Keitel-Schulz, Qimonda
Welnic RWTH Aachen University "The role of vacancies in phase change materials – controlling material properties from first principles" (invited)
Dae-Hwang Kim et al., RWTH Aachen University "3d-simulation based analysis of cell design concepts for phase change random access memory"
M. Armand et al CEA-LETI MINATEC "Random approach for crystallization modelling in phase-change memory"
H. Gatzen et al., University of Hannover "A Slider with an Integrated Microactuator (SLIM) for Second Stage Actuation in Hard Disc Drive's"
V.L. Safonov, Mag & Bio Dynamics Inc. "Hard disk drive as a logic device"

16:00 Goodbye from local chair

Coffee

List of Contributed Posters

Nr	Poster Contributions
1	C. Papusoi et al., SPINTEC "Heating and cooling dynamics in thermally assisted MRAM"
2	R.C. Sousa et al., SPINTEC "Determination of the absolute heat capacity in magnetic tunnel junction nanopillars"
3	I. Guhr et al., University of Konstanz "Perpendicular exchange bias in [Pd/Co]-CoO nanostructures"
4	S. Tibus et al., University of Konstanz "Magnetic patterning by focused ion beam irradiation"
5	F. Springer et al., University of Konstanz "Formation of magnetic patterns using spherical nanoparticles"
6	M. Delalande et al, CEA Grenoble "Core-shell structure of FePt nanoparticles synthesised by a chemical route: a comparative study"
7	M. Jean-Philippe Attane et al "CEA Grenoble "Domain wall depinning over a single defect : the role of thermal activation"
8	T. Parnell et al., University of Warwick "Soft Detection-Decoding Schemes for the Probe Storage Read Channel"
9	A.M. Hoexum et al., University of Twente "Transfer of wireless microactuators for data storage purposes"
10	A.M. Hoexum et al., University of Twente "Image charge stepping actuator for data storage purposes"
11	A.J. le Fèvre et al., University of Twente "Field emission to control tip-sample distance in probe recording"
12	M. Patrascu et al., IMEC-NL/University of Twente "Wear and friction of silicon nitride surfaces of an electrostatic MEMS actuator for μ SPAM"
13	M.G. Khatib et al., University of Twente "Exploring the Data-Layout Design Space of MEMS-Based Storage Systems"
14	J.P.J. Groenland et al., University of Twente "2d coding for probe recording on magnetic patterned media"
15	M.H. Siekman et al, University of Twente "In-field vacuum Magnetic Force Microscope"
16	T. Bolhuis et al., University of Twente "Scanning Probe Microscopy Markup Language"
17	B.J. van der Zwaag et al., University of Twente "Tuning Probe-Storage Parameters for Quality of Service"

Poster Contributions by Speakers

Organisation

Organisation Committee
Co-chair: Bernard Bechevet (CEA, Grenoble, F)
Local chair: Leon Abelmann (University of Twente, NL)
Organisation: Karen Wannyn (University of Twente, NL)
Infrastructure: Thijs Bolhuis (University of Twente, NL)
Finance: Hans Groenland (University of Twente, NL)
Communication: Martin Siekman (University of Twente, NL)

Technical Committee
Chair: Manfred Albrecht (University of Konstanz, G)
Co-chair: Yves Samson (CEA, Grenoble, F)

Members
Claude Chappert (Universite Paris Sud, F)
David Wright (University of Exeter, UK)
Matthias Wuttig (RWTH Aachen, G)
Hartmut Richter (Thomson, F)
Roberto Bez (ST Microelectronics, I)
Doris Keitel-Schulz (Qimonda, G)

Conference Location and Date

The address of the conference location is:

Eden Dish Hotel
Boulevard 1945 Nr2,
Enschede,
NL-7511AE,
Netherlands
Tel +31 (0)53 850 6600

The conference will be held on June 18, 19 and 20, 2007 at the [Eden Dish Hotel](#), located in the city center of Enschede, the Netherlands at walking distance from the main station. The Hotel has limited free parking space. Opposite of the hotel there is an underground car park, which costs € 7.50 per day.

The city of [Enschede](#) offers a plentitude of shops, theatres, museums, galleries, restaurants, pubs and sunny terraced cafes all within walking distance. And the casino is just opposite the hotel

On the last day of the conference (June 20) there will be a secured luggage room available for **all** IMST2006 attendees. So everyone can check out of the hotel and take the luggage to the Dish hotel.

Transportation

Enschede is easily reached from Amsterdam and Amsterdam Airport Schiphol by car (165 km) or [direct train connections](http://ns.nl) (<http://ns.nl>) (2 hours; please fill in from: Schiphol to: Enschede). From the railway station Enschede it is only a 5 minute walk to the Dish Hotel where the IMST2007 is held (see map on the next page).

However when traveling to Enschede by train during the weekend of June 16 and 17 one might encounter some difficulties.

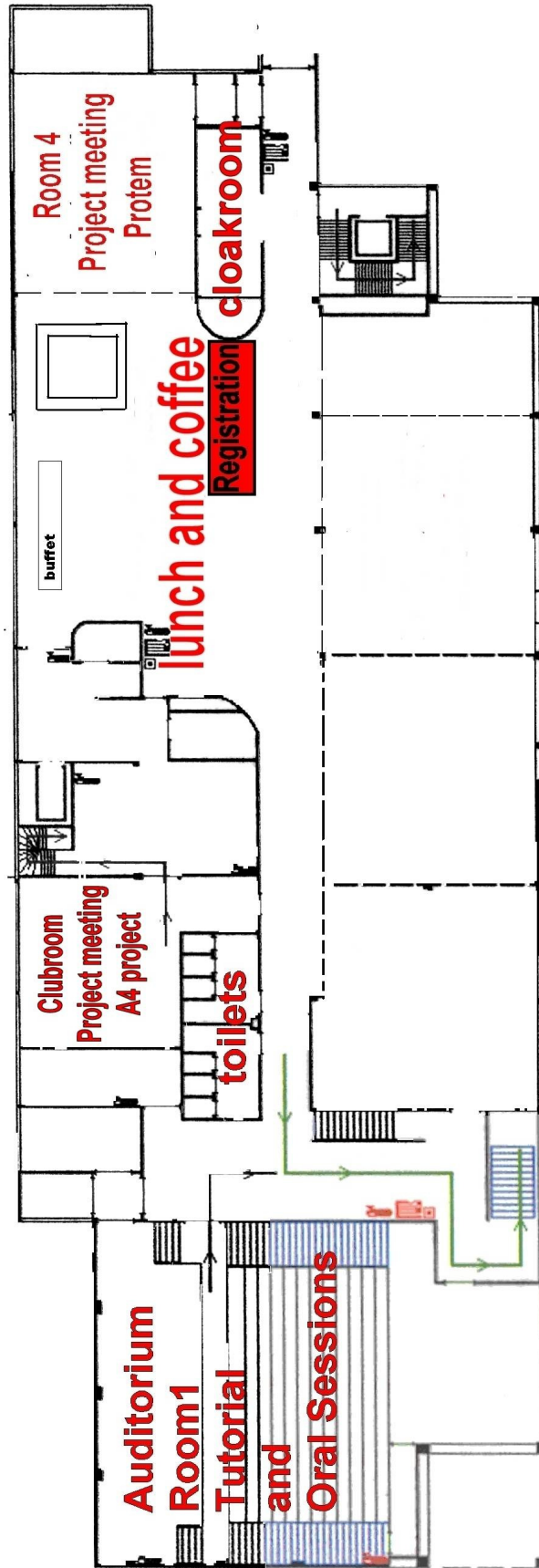
The weekend preceding the IMST2007 the dutch railway company (NS) will perform a number of construction activities on the railway system, especially towards (and from) Enschede. Please take an extra 15 to 30 minutes traveling time into account.

Coming from Schiphol-Amersfoort- Deventer there are no intercity trains available from Deventer to Hengelo-Enschede. Best way to come to Hengelo or Enschede is to first take a train to Deventer an then take the available express busses at the railway station in Deventer, to Hengelo and Enschede.

Coming from Zwolle there are no trains running from Wierden to Hengelo, Enschede. Take the express busses at the railway station Wierden to Hengelo, Enschede.

Coming by international train from Germany via Oldenzaal there are no trains available between Oldenzaal and Hengelo. Please use the Syntus bus from Oldenzaal to Hengelo. From Hengelo you can take the train or bus to Enschede.

IMST2007 Dish Hotel 1st floor



Recommended Restaurants

There are many places where you can eat in Enschede, offering a wide variety of dishes. Sometimes it can be difficult to choose. Therefore we compiled a list of restaurants we like.

Most restaurants in this list will offer something special for the IMST attendees. So, be sure to flash your badge in these restaurants when you go there.

Kostersshoes

Stadsgravenstraat 57, Tel: 053 4342161



Price range of a main dish: 12,50 – 24,50 euro

<http://www.kostersshoes.nl/index.php>

de Tropen

Bolwerkstraat 9, Tel: 053 4345350



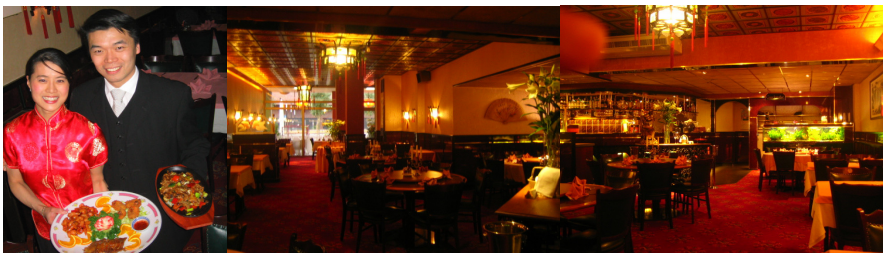
Price range of a main dish: 15,50 – 22,50 euro

This restaurant offers free coffee or tea after dinner if you show your badge.

<http://www.restaurantdetropen.nl/>

Chinees Specialiteiten Restaurant International

Boulevard 1945 322, Tel: 053 4312420



Price range of a main dish: 9,00 – 20,00 euro

This restaurant offers you some appetizers if you show your badge

Goody's American Steakhouse Eatin' & Drinkin'

Marktstraat 2, Tel: 053 4361006



Price range of a main dish: 9,00 – 24,50 euro

This restaurant offers a nice aperitif and some amuse if you show your badge.

<http://www.steakhousegoodys.nl>

Sam Sam cafee

Oude Markt 15/17. Tel: 053 4303929



Price range of a main dish: 12,50 –18,95 euro

This restaurant offers a free desert if you show your badge

<http://www.samsam-enschede.nl/welkom.php>

De Fusting Eetcafé Down Town

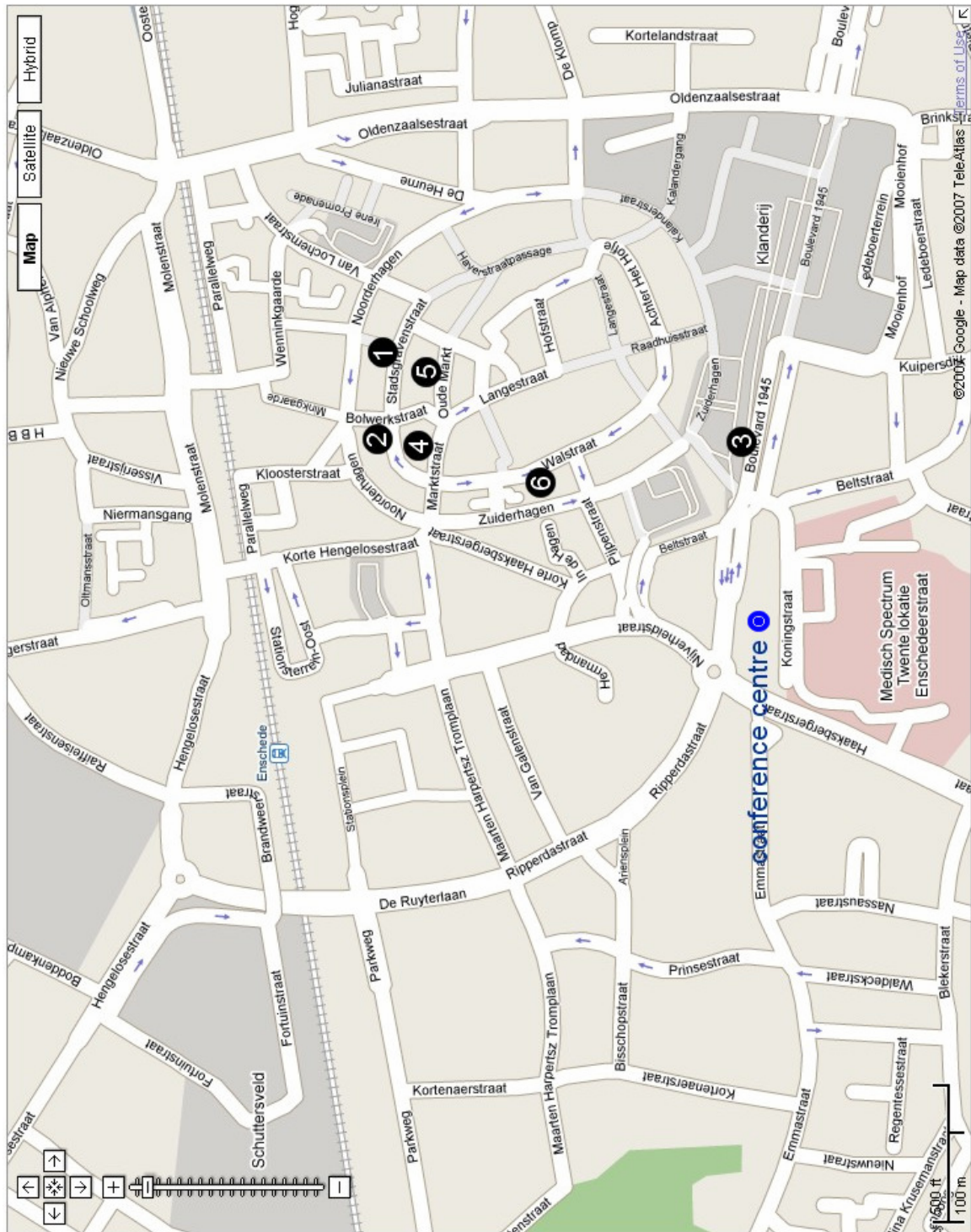
Zuiderhagen 16, tel. 053-436 77 87



Price range of a main dish: 8,75 –16,75 euro

<http://downtown.defusting.nl/>

1) het kostershoes, 2) De Tropen, 3) Chinees International, 4) Goody's, 5) Sam Sam, 6) De Fusting



Guidelines for oral and poster presentations

Oral Presentations

Oral presentation will in principle be done by means of digital projection only. Please notify the organization committee before the start of the conference if this causes a problem for you.

Contributed talks are 12 minutes plus 3 minutes for discussion. Invited talks are 25 minutes plus 5 minutes for discussion.

Presentations can be run from individual notebooks or on a notebook provided by the organization. When running from your own notebook, make sure the output resolution is 1024x768, no more than 70 Hz. When you want to upload your talk on the conference notebook only Powerpoint or PDF presentations are allowed. Uploading can be done by memory stick or CD, or by e-mailing your talk before the conference to program-imst2007@ewi.utwente.nl.

To make sure the transitions between talks is smooth, please test your notebook settings before the session, or upload your talk on the conference notebook. An operator will be available before and after the sessions. Please do not wait until the very last moment, but test your presentation well in advance. The organization will be very strict in keeping the time-schedule, and any time lost by rebooting etc, will be reduced from your speaking time.

Poster presentations

Poster boards will be available during the duration of the conference. The boards are numbered to match your entry in the program booklet. The poster dimensions allowed are up to 950 mm wide, 1150 mm high (but A0-paper format will also do). We especially encourage presenters of oral presentations to present a poster as well, since this will stimulate discussion. Moreover, the best poster will be awarded the MESA+ poster price. Posters will be rated by a (secret) jury, who will judge scientific contents, clarity and appeal.

Please put your poster up well before the beginning of the poster session.