

News in Thermology

7th Congress of the Polish Society of Thermology

The Polish Society of Thermology made the first announcement for their 7th Congress.

The congress takes place in Zakopane, the venue of the congress is the Pension "HYRNY", Pilsudskiego Str.20, 34-500 Zakopane.

Deadline for abstracts is 15.12.2003. Abstracts should be submitted in English on a floppy disk or by email to the address: ajung@wim.mil.pl

Deadline for registration is 15.03.2004. Registration fee is 100€ and will be paid on site. The fee includes:

Accommodation in the HYRNY pension (double room) from 3.04.2004 (dinner) to 5.04.2003 (breakfast), meals, participation in all scientific sessions, congress materials and participation in the social programme. Participation in the congress will be confirmed by certificate.

For registration, please fill in the registration form, and send it for confirmation to the Organizing Committee at

Klinika Pediatrii i Nefrologiii Dzieciacej
Wojskowego Instytutu Medycznego
00-909 Warszawa, ul. Szaserow 128
Phone: +48 22 6817-236 Fax: +48 22 6816-763
email: ajung@wim.mil.pl

31st Annual Meeting of the American Academy of Thermology

Greetings Fellow Thermologist;

We (your local hosts: Ram C. Purohit and David D. Pascoe) would like to personally invite you to participate in the 31st Annual Meeting of the American Academy of Thermology and the Conference on International Standards for Thermology in Human and Animal Research and Medicine. With 28 years of thermography experience in human and veterinary medicine we are very proud to be your host for this very important conference.

The meeting will be held on the Auburn University College of Veterinary Medicine campus in Auburn, Alabama from April 15-18, 2004. We have developed and planned sessions (scientific papers, tutorials, standards symposium, and special interest group discussions) that will be informative and enhance the participant's understanding of the scientific basis and use of infrared thermography. Our objective for this meeting is to encourage scientific dialogue between conference participants that represent thermologists from all countries and disciplines.

In conjunction with the Academy meeting, we have developed conference symposiums which seek to develop a

better understanding and review of thermal imaging standards for human and veterinary medicine. We strongly believe these sessions will lead us towards common guidelines for the use of infrared thermography in medical practice and scientific research.

Please make plans now to attend this meeting. We will be finalizing the meeting schedule after the December 1, 2003 deadline for abstract submission. For those who have submitted abstracts and/or registered, we will use your email address to provide you with a program update and the final conference schedule. Again, we are looking forward to this meeting and your participation. See you at Auburn in April!!

6th International Congress of Thermology (ICT)

Dear Colleagues, on behalf of the organizing committee of the 6th International Congress of Thermology (ICT) and the 13th Annual Meeting of the Korean Academy of Medical Thermology (KAMT) which will be held in Seoul on June 5-6, 2004. It is a great honor and pleasure to host the 6th ICT. We will do our very best as to host you cordially throughout the meeting with every means of convenience.

In the congress, we can get more understanding about a modern knowledge made since the last ICT and more information about new technologies with vigorous, stimulating and fruitful discussion. To every attendee, may I once again extend warm greetings, and hope that this Symposium nourish you with the latest information to meet the demands of your profession and also provide many unforgettable pleasant memories of Korea to bring home with you. Finally, I would like to extend my sincere appreciation to each and every one who has given their assistance and support in many ways in preparing this 6th ICT and 13th KAMT.

Professor Young Soo Kim MD., Ph.D.
President of ICT and KAMT

Main topics of this conference are thermal physiology and thermal regulation, thermal imaging and related technique, clinical application of thermology in neuro-musculo-skeletal disease, pain medicine. CNS, complex pain syndrome, peripheral vascular disease, deep vein thrombosis, pediatric disease, rheumatology, oriental medicine, dermatology, oncology, sports medicine and, of course, infrared technology.

Deadline for abstract submission is : March 15, 2004,

Abstracts can be submitted by E-mail to the Congress secretariat. Secretary General Yong-Eun Cho, M.D., Ph.D.,

Department of Neurosurgery, Yongdong Severance Hospital, Yonsei University College of Medicine, Seoul, Korea, Tel : +82-2-3497-3390, Fax +82-2-3461-9229, E-mail:ydnscho@yumc.yonsei.ac.k

The preferred form for submissions is by electronic means with E-mail to ydnscho@yumc.yonsei.ac.kr. If electronic submission is not possible, two hard copies of the paper should be sent to:Yong-Eun Cho, MD., Ph.D, Department of Neuro surgery, Yongdong Severance Ho-

spital, Yonsei University College of Medicine, 146-92 Dogok-dong, Gangnam- gu, Seoul 135-720, Korea, Tel : +82-2-3497-3390, Fax : +82-2-3461-9229

Deadline for registration is May 8, 2004. The conference language is English.

The venue of the congress is the New Millennium Hall at Konkuk University, #1 Hwayang-dong Gwangjin-gu, Seoul 143-701, Korea Tel +82-2-455-1896-7, Fax +82-2-455-4084 <http://www.konkuk.ac.kr>

UK Symposium on Medical Thermal Imaging II

Paul Campell

St Andrews University and Ninewells Hospital, Dundee

Overview

Following on from the previous year's inaugural event at the Royal Free Hospital, London, the Second UK Symposium on Medical Thermal Imaging was held on September 18th 2003, at the University of Bath, England. The meeting was again organised by Paul Campbell (St Andrews University and Ninewells Hospital, Dundee) and Kevin Howell (Royal Free Hospital), and was themed with an emphasis on *self-help* within the medical thermal imaging community. To that end, speakers were invited from the spectrum of clinical activities and encouraged to identify areas with distinct collaboration potential: the ultimate aim being to form a dedicated UK network for medical thermology that will hopefully be supported by the research councils. In the event, 29 people attended, representing the majority of the UK academic and clinical community, as well as several industrially related figures who also demonstrated the latest generation thermal imaging hardware in a parallel manufacturers exhibition.

Self Help

The self-help aspect of the meeting was underscored by the attendance of several key speakers. The first of whom was **Dr Peter Plassman** (Glamorgan University). Peter advised the audience on the procedures for upgrading older (and often discarded) Agema camera systems so that their performance can compete with many of the latest generation systems. Peter explained the electronic principles behind the camera design and illustrated the physical and software approaches needed to improve resolution with these older systems: an invaluable lesson for those wishing to breathe new life into old kit. The marked enhancement in performance is illustrated by the images shown in figure 1 below.

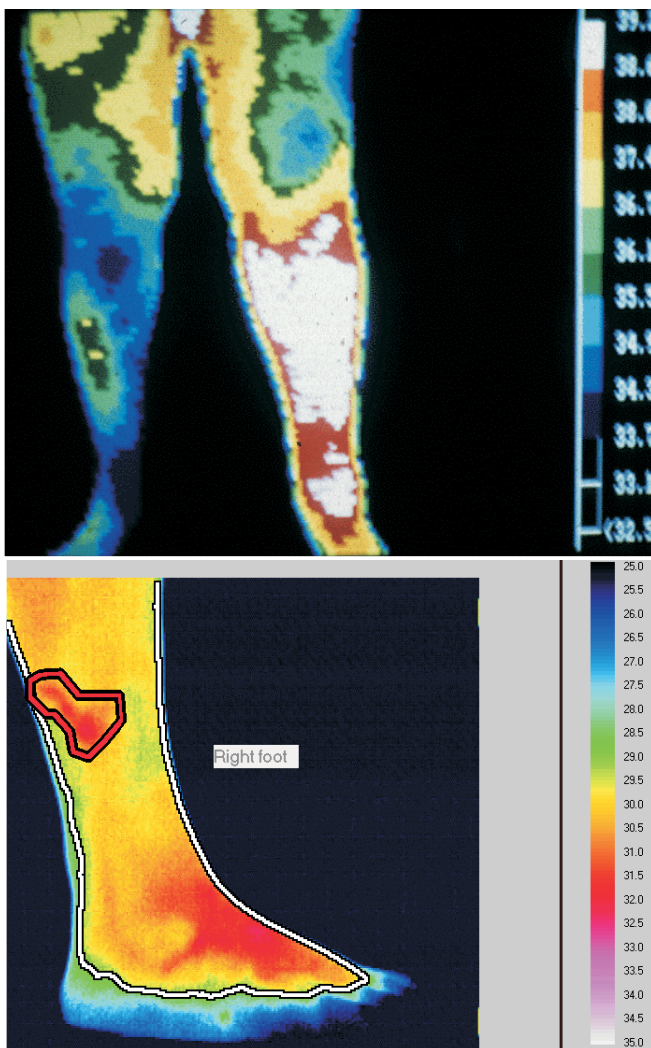


Figure 1. Upgrading the Agema 780 Series. The initial image quality was a mere 140 x 140 pixels/12 colour, as shown above left (courtesy Dr Richard Harding). After upgrading, the system now boasts a 256 x 256 pixel/128 colour image that can be displayed at 1098 x 756. The improvement in resolution is obvious.

Information on the C THERM code used as the software core, and developed by the Glamorgan group can be found at:

<http://www.comp.glam.ac.uk/pages/staff/pplassma/>

In the afternoon session, Peter also described his involvement in developing a bid to the EU for a Multi-Spectral Imaging Consortium. Not only was Peter's talk interesting and indeed entertaining, but it was also highly informative in detailing the application procedure, with its many potential stumbling blocks, when constructing a proposal to the EU. Details of the MUSIC bid can be found at:

<http://ltg4.comp.glam.ac.uk/music/>

The committee for the UK Symposium wish Peter and his colleagues and collaborators every good fortune with this application.

Also within the self-help category, **Mr Rob Simpson** (NPL) showed the initial results that have been obtained with a new black body calibration source developed specifically for use within the medical thermography community. This device allows medical thermographers to have traceable [to ITS-90] and manufacturer independent calibration of their cameras, thus ensuring that temperature measurement, and subsequent diagnostic assessments based thereon, are of the highest integrity. Initial tests undertaken at NPL and the Royal Free indicate that the source is highly stable and well within the tolerances specified at the design stage. The calibration source is currently undergoing a second trial at Ninewells Hospital after which it will have a final test under the auspices of Professor Ring at Glamorgan. It is hoped that the black body calibration source will be available for general use within the community within next twelve months.

Computer modelling methods represent a valuable complimentary aspect to thermal imaging work, especially when the predictive capabilities of the model can be used to optimise protocols that may be either expensive or unsafe to undertake on a trial and error basis. **Dr Charlie Song** (University of Dundee) gave an overview of the application of finite-element (FE) methods as a computational adjunct to thermal imaging. Dr Song's talk made use of animated models showing the calculated temperature field in the vicinity of heated-activated surgical staples and also illustrated how real thermography data is used to validate computational models of such dynamic events. Elements of the talk are featured in two recently published articles [1,2].

The final talk in this category was delivered by **Adrian Walker** and **Peter Anthony** (Rutherford Labs) who described the facilities available at the Engineering and Physical Sciences Research Council (EPSRC) equipment loan pool: a facility which most attendees were not aware even existed! The freely available kit includes several Agema systems and a latest generation FLIR SC3000 thermal imager, among a myriad other useful (and usually prohibitively expensive) types of specialised imaging instrumentation. The procedure for application to the

loan pool was also detailed and the waiting times outlined. An interesting overview of a previous thermographic application of the on-loan instrumentation was also provided.

Clinical Aspects

The clinically related talks were concentrated on topical issues where the employment of thermal imaging is making a tangible impact.

Professor Francis Ring gave a fascinating address on complex regional pain syndrome (CRPS), a condition that often presents with patient sensations of severe burning or aching pain, increasing with the slightest touch or breeze (type 1 CRPS). Initial thermographic analysis showed a limb temperature asymmetry of up to 2.7°C. In developing a therapy, Professor Ring's group took a cue from the seminar work of Ramachandran [3] which showed that phantom limb pain results from disruption of the normal interaction between motor intention to move the limb, and the absence of sensory feedback (proprioceptive). When a mirror was introduced to provide visual feedback of a healthy (reflected) limb, then sensation of pain was reduced. visual feedback using a mirror image of the healthy limb might interrupt the pathological cycle. re-establishes pain free relationship between sensory feedback and motor action. Further, the subjective assessment of pain [reduction] was complimented with infrared thermal imaging objectively indicating the normalisation of temperature in these patients after visual feedback therapy. Further details are now available in published form [4].

Lasers are now established as the preferred method of treatment for a range of clinical skin disorders including vascular lesions and it is a common requirement to deliver the laser energy to a sub-dermal region such as a blood vessel, while minimising the temperature rise at the skin surface. **Dr Roderick Thomas** (Swansea Institute) delivered a beautifully illustrated talk showing how infrared thermography is being used to optimise laser therapy both empirically, and via the use of computer models. Rod also outlined the challenges and rationale for adopting laser approaches as opposed to alternative

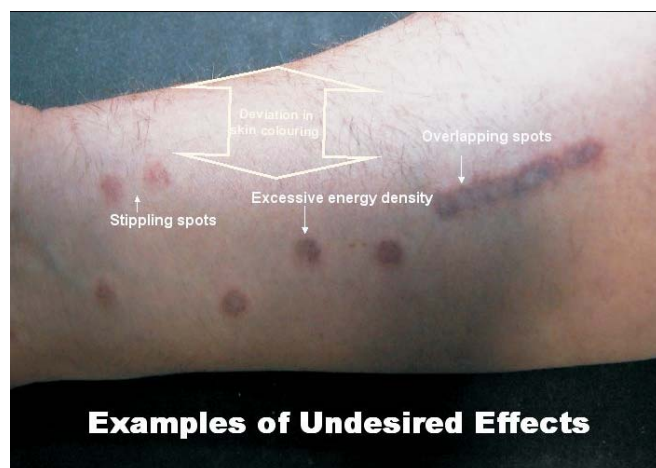


Figure 2
Examples of undesired effects of laser Therapy

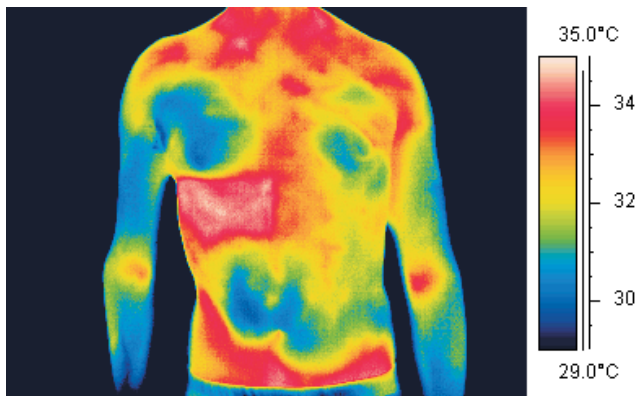


Figure 3
Infrared thermogram showing inflammation of active morphoea plaques at the chest and abdomen (Royal Free Hospital)

techniques such as cryosurgery or excision. The undesirable effects of non-optimised treatment were also reviewed (as pictured below), as well as the successful case studies drawn from the range of applicability of laser treatments. Rod also described the development of computational models to predict radiative and thermal transport through the tissue, and validated these models against real thermography based data.

Kevin Howell (Royal Free Hospital) presented a review of thermography for the assessment of morphoea. He explained that the disease was the most common connec-

tive tissue disorder in children, causing fibrosis of the dermis in localized skin areas, often along with atrophy of the subcutis and underlying musculature. Thermography has been shown to be effective for assessment of the inflammatory early stage of morphoea, and is the subject of ongoing research at the Royal Free and Great Ormond Street Hospitals (5).

Other speakers included **Drew Heusch** (Effect of body fat on skin temperature), **Gary Chamberlain** (SARs detection), **Carl Jones** (Image Registration and Overlay) and **Steve Hollock** (Inexpensive IR detectors and applications).

The meeting was generously sponsored by both the UK Thermography Association (UKTA) through a reduced registration fee to their attending members, and also the Institute of Physics (IoP) by provision of travel bursaries to Dr Paul Campbell & Dr Maria Teresa Visentin.

References

- [1] C Song, P A Campbell, T G Frank, A Cuschieri. *Smart Materials and Structures* 11(3), 1 (2002)
- [2] Y, Ng, C. Song,... & P A Campbell. 83, 1884 *Applied Physics Letters* (2003)
- [3] VS Ramachandran & D. Rogers- Ramachandran *Proc. R. Soc. Lond.* 1996
- [4] McCabe, Haigh, Ring, Halligan, Wall, Blake et al *Rheumatology* 2003; 42:97-101
- [5] Martini G, Murray KJ, Howell KJ et al *Rheumatology* 2002; 41: 1178-1182