

# newsletter

## adria training: more display savvy for European industry professionals

Combine the best teaching modules of universities and share the experience of the best professionals in the displays world: a dream for European displays education? adria wants to make it happen! adria's plans to push display brain power for the industry are the major topic of this edition.



Join adria training and enjoy success!

If we believe that "brains are Europe's biggest resource" then trained scientists and skilful engineers are essential for a competitive advanced displays community in Europe. Here is the challenge: Although programs for training and education in advanced displays already exist on various levels – professional as well as academic – today, a common European approach to displays education is not available.

Today's displays specialists started with an engineering or physics degree and had to specialise in the field later – mostly on the job. Two measures would

speed up the process and would greatly facilitate displays innovation:

- **A European displays masters degree**, i.e. teaching students with a common curriculum, as well as
- **Training seminars for industry professionals.**

adria targets both routes: Of course it is too ambitious to establish a European masters degree in a two years project. However, our experts work out how to accelerate the progress. Learn more about how adria makes the first steps towards this education goal in the next but one edition of this newsletter.

The training route will be implemented directly by adria: Three training seminars in three countries are scheduled for this year. You are new to the displays field or want to enhance your knowledge? Then here is the offer:

## A displays universe in three days

**Everything you always wanted to know about displays – don't be afraid to ask!** Three days will give a full insight into latest displays technology – LCD, PDP, FED, OLED, flexible displays, Active Matrix backplanes, micro-displays. The lectures are given by renown experts in the fields. Moreover, each program includes a portion dedicated to specific questions from the trainees. Target group, strategy, background, experts, program, locations: **Read more inside!**

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**advanced displays  
research integration action.**

**adria's mission**  
is to strengthen the advanced display industries in Europe by creating a European platform for advanced displays research and technology

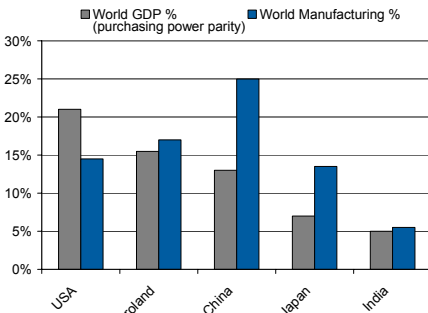


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## Training in the light of the trend “manufacturing vs. service”

Western economies have shifted from manufacturing to services in the last decades. With information and communication technologies being “generic”, our technology-based economy is developing into a knowledge-based economy. So on which topics should displays training seminars focus on – the manufacturing oriented panel technologies or the service oriented image and signal processing?



World GDP and manufacturing  
Source: JCF/Ecowin

In the displays area, the added value seems to be more in the product and its specific functions than in the components: The huge investments made in Asia will allow much more products and applications to benefit from the added value advanced flat panel displays offer. Different technologies are competing to gain market shares for different applications.

However, the image quality of displays depends on both panel as well as components technology and processing electronics know-how. The industry behind panel manufacturing itself is a lot different than the one for electronic processor and memory components.

Can Europe benefit from an own manufacturing base or should we concentrate on components technology? A well educated and trained workforce are crucial for both routes – here is how we decided to proceed:

### Optimising labour and investment costs

	2004	2025	Δ%	Youth
<b>World</b>	<b>6477</b>	<b>7956</b>	<b>22.8</b>	<b>29%</b>
China	1304	1476	13.2	22%
India	1104	1363	23.5	36%
EU25	461	474	2.8	16%
Germany	83	82	-0.6	15%
France	61	63	4.4	19%
UK	60	65	7.6	18%
USA	297	349	17.8	21%
Russia	143	130	-8.9	16%
Japan	128	121	-5.2	14%

Table 1: World population 2004-2025  
Source: INED

adria prepares future European Advanced Displays activities. Where are we heading? Forecasters say that the population in the USA will grow faster than the one in China and the population in the European Union will not decrease! Labour cost will be progressively redistributed. The Youth Factor (i.e. population in % younger than 15 years of age) combined with 2004-2025 evolution shows that future will provide some surprises...

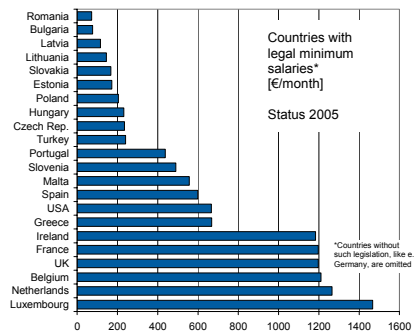


Table 2: Countries with legal minimum salaries; Source: EU Commission

Table 2 shows an opportunity for Europe in terms of legally allowed minimum salaries available to build a better equilibrium between industrial manufacturing and services: Obviously in the next 10 to 20 years, labour cost will become more balanced in Europe and also in the World.

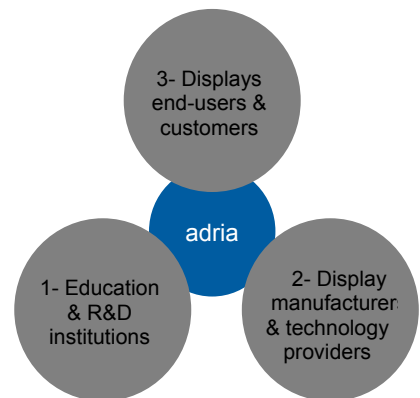
Industrial production has generally some interest to settle close to customers, except when labour cost

and/or capital cost provide strategic advantage elsewhere. But shipping costs, energy and oil price, global ecology and sustainable development will rectify the excessive relocation of manufacturing.

LG Philips recently announced to install a manufacturing site for FPD-TV sets in Poland, other companies already successfully produce with a combination of front-end manufacture in western European countries and back-end/assembly in Eastern European countries. This way, Advanced Displays production can become an important part of European activities in the future. Therefore we believe that it makes sense to focus the adria training seminars this year on sessions with Display panel technologies.

### Linking the communities

adria links three different communities: (1) the higher education and R&D institutions, (2) the display manufacturers and technology providers, and (3) the display end-users.



The knowledge about advanced displays is mostly shared between communities 1 and 2, whereas the knowledge about advanced products that use advanced displays is mostly shared between communities 2 and 3. Keeping this in mind, the seminar content will be different from an education's one: shorter, less scientific-oriented and more application-driven and lecturers will come from community 1 and 2.

## Training seminars: background and program details

**The three-days seminars are “designed” for people having a basic knowledge on advanced displays.**

For example, it is not scheduled during these seminars to come back on the signification of acronyms like CRT, LCD or PDP. The seminar will present an overview of all technologies – already available or coming soon – giving valuable inputs to product engineers as well as to decision-makers who drive the development of electronics systems. The expected result is the implementation of the best display technology in the electronics product road-maps of European companies.

### The structure

The three-day seminar will be divided in three one-day sessions; each day will include three lectures of 1.5 hours each. Each day ends with a session dedicated to Questions & Answers. Trainees will have the opportunity to talk about the challenges in their specific working environment and are encouraged to prepare questions, e.g. “Which display is most suitable on a long term for my application?”.

The Q&A exchanges will improve interactivity, share experience and reinforce, if necessary, the link between technology and applications or Industrial concerns. Answers will be commented by the team of speakers. So, in conclusion, the seminar programs are not closed but opened to participant concerns.

### The first day presents displays based on phosphors excitation.

The lecture “Seeing displays, merits and shortcomings” will act as an introductory to the training by reviewing flat panel displays characteristics as observed by the user and will emphasise advantages and drawbacks of the technologies. Luminance and contrast ratio under ambient light,

response time and video rendering are the key-points that will be addressed.

The lecture “PDPs versus CRTs” presents and compares the two technologies with reference performances. CRTs for phosphor performances, brightness, colour rendering, view angle; PDPs for high brightness and high contrast. The latter are used for large TV and public information & advertising, and will have to compete on these two markets with LCD technology.

The lecture “future FED panels based on CNT electron sources” reviews a more exploratory field. After the stop of microtips FED programs, it is likely that carbon nanotubes could be used as electron sources for new FEDs, with some advantages like emission stability and also a much larger interest than only displays, i.e. high speed electronics, sensors...

### The second day presents displays that use spatial modulation of light sources.

The lecture “Direct-view LCDs” presents the most popular technology that covers nearly all the applications from small mobile to large household; but even if LCDs are dominating, manufacturers have to improve performances continuously to compete on markets with aggressive competitors like PDP and projection for large TV sets or OLED for small portable applications.

The lecture “micro-displays” will present devices used in near to eye or projection configuration; different technologies (DMD, LCoS or OLED on c-Si) share a yet small but very promising market.

The lecture “Active Matrix technology” addresses the backplane, the key element that distinguishes displays from pure lighting effects. AM had pushed the LCDs to the high

information display segment, required either by HDTV or by PC applications. Large development efforts that are currently put on AM-OLED displays are related to the electroluminescent diode addressing which makes it a quite “hot” topic.

### The third day presents the organic material, components and displays.

The lecture “organic electroluminescent materials” is the second one not focused on display effects but on materials: the electroluminescent organic ones; their use is not restricted to displays but also find application in lighting. Europe exhibits a strong position in this field, supported by the OLLA EC funded project.

The lecture “Organic Light Emitting Displays and flexible displays” will present research, development & production activities in the field of emissive (OLED) displays and introduce flexible displays technologies developed in Europe, and supported by the FLEXIDIS EC funded project.

The lecture “Electronics on plastic” is not directly related to displays but recent progress obtained in carrier mobility of polymer material open the door to printed electronics and printed active matrix circuitry on large surfaces. Europe is looking for a technological leadership in this field supported by the POLYAPPLY EC funded project.



A huge variety of display technologies  
 Photo: K.H. Blankenbach

## adria training: target groups and locations

### Who should attend the seminars?

**Basically everybody affiliated with industry branches involved in displays technology needs the background taught in the seminars:**

### Equipment and materials suppliers:

Europe leads a strong position in equipment and materials for advanced display manufacturing: their development requires long cycle time and precedes the manufacturing of the display itself by years. In a global competition context, it's crucial to identify technological paths as early as possible; doing this, R&D and return on invest can be optimized.

**Display end-users:** Europe is one of the biggest and most demanding market for displays. End users like the transportation sector, and the electronics sector for entertainment, communication, or instrumentation applications. Displays are a key differentiation factor and thus a factor for competitiveness.

**Display manufacturers:** Europe can regain strength in displays manufacturing, especially if a technology jump appears, driving new investments. It must be emphasised that material cost dominate the manufacturing cost of displays with only 5% fraction of labour cost.

### Registration

The registration fees for the three-days training seminars are 1450€ / 995£. Registration forms and information can be downloaded from the adria web-site: [www.adria-network.org/training](http://www.adria-network.org/training)

advanced displays research integration action



1<sup>st</sup> Announcement

**3-days training seminars**

**"Advanced Displays"**

For the first time in Europe,  
a training seminar on "advanced displays" is organised on a European scale  
in the frame of adria the advanced display research coordination action:

3 dates (2006)	1 seminar	3 countries
May, 9-11,	Pforzheim University,	Germany

For more details see flyer inside.

### Location and dates

#### ■ Pforzheim University

May, 9 to May, 11, 2006  
Pforzheim, Germany.

Located at the black forest between Stuttgart and Karlsruhe, the Pforzheim region has a high reputation in display metrology and both automotive and industrial based display systems.

#### ■ Milton Keynes

June, 27 to June, 29, 2006  
Bletchley Park, Milton Keynes, UK  
Located 50 miles North-West of London, Bletchley Park is a historic place where the headquarters of the UK Display Network are based.

#### ■ Bordeaux University

November 14 to Nov.16, 2006  
Bordeaux-Talence, France.  
Beside famous Château Margaux vineyards, this "domaine" is an historic priory, where the Bordeaux University has installed new spin-off companies.

Don't miss the opportunity to attend!

## Events Calendar

March 9-10, 2006

**SID Mid-Europe Chapter Spring Meeting 2006**  
High Tech Campus, Eindhoven, The Netherlands

March 28-30, 2006

**FPD China 2006 trade fair**  
Shanghai New International Expo Centre, P.R. China

April 3-7, 2006

**Organic Optoelectronics and Photonics II Conference**  
Strasbourg, France

April 4-6, 2006

**DISPLAY 2006, 8<sup>th</sup> Edition**  
CNIT - Paris La Défense, France

April 5-6, 2006

**SID UK General assembly and technical meeting**  
Knebworth Park, Stevenage, UK

For updated information see [www.adria-network.org](http://www.adria-network.org).

A consortium of six partners – industry and academia networks themselves – provide the adria platform services:



## 1<sup>st</sup> Announcement

# 3-days training seminars “Advanced Displays”

For the first time in Europe,  
a training seminar on *advanced displays* is organised on a European scale  
in the framework of **adria**, the *advanced displays research coordination action*.

3 dates (2006)	1 seminar	3 countries
May 9-11,	Pforzheim University,	Germany
June 27-29,	Bletchley Park, Milton Keynes,	UK
November 14-16,	Bordeaux University,	France

### Locations and venues:

#### **Pforzheim University of Applied Sciences**

Located between Stuttgart and Karlsruhe, the region of Pforzheim is well known for development and manufacturing of automotive and industrial display systems with the host of the seminars, the University of Applied Sciences Pforzheim, being a competence center for display metrology. The seminar in Pforzheim is organised by the "Deutsche Gesellschaft zur Förderung des Maschinenbaues (GzF)" located in Frankfurt.

#### **Bletchley Park, Milton Keynes**

Located 50 miles North-West of London, Bletchley Park is a historic place, accommodating the headquarters of the UK Displays Network.

#### **Université de Bordeaux, Domaine du Haut Carré, Talence**

Besides the famous Château Margaux vineyards, this “domaine” is an historic priory, where the University of Bordeaux has installed some of its new spin-off companies ([www.u-bordeaux1.fr/SAIC](http://www.u-bordeaux1.fr/SAIC)).

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## Program

The training seminars are composed of three one-day sessions of three lectures each, provided by selected European experts in the field, covering the following topics:

### Day 1: displays based on phosphor excitation (CRT, PDP and FED [SED-CNT] displays)

- 9h00 – 10h30: **Seeing displays, merits and shortcomings**  
*by Karlheinz BLANKENBACH, Pforzheim University*
- 10h45 – 12h15: **PDPs versus CRTs**  
*by Sebastien WEITBRUCH, Thomson Brandt*
- 13h30 – 15h00: **Future FED panels based on CNT electron sources**  
*by Vu Thien BINH, Université Lyon 1*
- 15h15 – 16h45: Q&A on “phosphor displays”  
*round table with all speakers, moderator: Karlheinz BLANKENBACH*

### Day 2: displays using light source spatial modulation, direct view LCDs and micro displays

- 9h00 – 10h30: **Direct-view LCDs**  
*by Jose MAGARINO, Thales Avionics LCD*
- 10h45 – 12h15: **Micro-displays**  
*by André VAN CALSTER, Ghent University*
- 13h30 – 15h00: **Active-matrix technologies**  
*by Didier PRIBAT, CNRS/Ecole Polytechnique*
- 15h15 – 16h45: Q&A on “LCDs”  
*round table with all speakers, moderator: TBD*

### Day 3: the organic route to low-cost & flexibility : OLED and large area “plastic” electronics.

- 9h00 – 10h30: **Organic electroluminescent materials**  
*by Tom Mc LEAN, Merck Chemicals*
- 10h45 – 12h15: **Organic Light Emitting Displays and flexible displays**  
*by Christophe PRAT, Thomson*
- 13h30 – 15h00: **Electronics on plastic**  
*by Seamus BURNS, Plasticlogic*
- 15h15 – 16h45: Q&A on the “organic route”  
*round table with all speakers, moderator: Tom Mc LEAN*

The program of each day includes a time dedicated to “Questions & Answers” (Q&A), a chance for open discussions guided by the moderator. The trainees will have the opportunity to talk about their specific problems in the field of advanced displays which usually result from their practical everyday work with displays. These problems can be prepared and phrased by the trainees in advance and competent answers will then be provided by the team of expert speakers.

## Registration Form

*Documents to be completed, signed and sent to:*

**Stefanie JOST-KOESTERING**

c/o VDMA  
 German Flat Panel Display Forum (DFF)  
 Lyoner Str. 18  
 D-60528 Frankfurt am Main  
 GERMANY

**adria secretariat**

Phone : +49-69 6603-1479  
 Fax : +49-69 6603-2479  
 eMail: sjk@vdma.org  
 Internet: www.adria-network.org

**Trainee :**

Mr, Mrs, Ms.		
	(first name)	(LAST NAME)
Company / Organisation :		
Address :		
Town :	Post Code:	Country:
Tel :	Fax :	
e-mail address :		

**Training Manager :**

Mr, Mrs, Ms.		
	(first name)	(LAST NAME)
Tel :	Fax :	
e-mail address :		

**IMPORTANT (tick the appropriate box), I register for the training seminar:**

- |              |   |                          |
|--------------|---|--------------------------|
| Training #1: | Pforzheim University, May 9-11, 2006<br>Pforzheim, Germany              | <input type="checkbox"/> |
| Training #2: | Bletchley Park, June 27-29, 2006<br>Milton Keynes, UK                   | <input type="checkbox"/> |
| Training #3: | Bordeaux 1 University, November 14-16, 2006<br>Bordeaux-Talence, France | <input type="checkbox"/> |

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**Trainee (first name, LAST NAME) :**

**Registration fee (including documents, breaks & lunches): 1450 € or 995 £**

**Payments have to be made to the local organiser (in € for training #1 and #3, in £ for training#2), coordinates and bank account details will be sent to the trainee by the local organiser.**

*Please note the following conditions:*

- *Accommodation cost is not included in the registration fees, hosting conditions and prices will be sent to trainee after registration.*
- *The number of trainees is limited; registration will become effective only after receipt of the payment of the fees.*
- *The seminar might be cancelled by the organizer if the number of registered trainees should be not sufficient.*
- *Cancellation of registration is free of charge if done no later than 30 days ahead of the first day of training, for later cancellations 15% of the fee will be charged for administration.*

**For French participants only:**

Le stage de Bordeaux peut faire l'objet d'une convention au titre de la formation professionnelle entre votre organisme et le Club-Visu, formateur agréé sous le N° 74190017019

(Contacter Béatrice SEGRETINAT ,    Le Club Visu, Tél-Fax : 33 1 43 86 60 53  
E-mail : [clubvisu@wanadoo.fr](mailto:clubvisu@wanadoo.fr))

Date :	Date :
Trainee name and signature	Authorized person, « training manager », name and signature

**Registration form page 2/2**