

## **Fire Retardant Technologies 2014 (FRT14)**

**University of Central Lancashire, Preston, UK  
14 – 17 April 2014**



### **Confirmed Speakers**

**Jenny Alongi  
Serge Bourbigot  
Ulrike Braun  
Giovanni Camino  
John R Ebdon  
Sabyasachi Gaan  
Yuan Hu  
Richard Hull  
Baljinder Kandola  
Paul Kiekens**

**Martin Klatt  
Sergei Levchik  
John Liggat  
Richard Lyon  
José-Marie Lopez Cuesta  
Heather Stapleton  
Anna A Stec  
Andrew P Taylor  
Jürgen H Troitzsch**

# PROGRAMME

## Monday 14<sup>th</sup> APRIL

Afternoon **Optional Tours of Local Fire Testing Laboratories (tbc)**

16.00 - 19.00 **Registration in the Darwin Foyer**

18.00 - 20.00 **Welcome Reception in the Darwin Foyer**

## Tuesday 15<sup>th</sup> April

08.00 - 08.55 **Registration and Refreshments available by the Registration Desk in the Darwin Foyer**

**All Lectures in the Darwin Lecture Theatre**

08.55 **Welcome and Introduction**

09.00 - 09.15 **Professor Paul Kiekens, COST-Flaretex Project Coordinator**  
*Ghent University, Belgium*

09.15 **Session 1: Overview**

09.15 - 09.45 **The Fire Retardant Spectrum: From Aluminium to Zinc, or Red to Green?**  
*Professor Richard Hull, University of Central Lancashire, UK*

09.45 - 10.15 **Techniques for Understanding Fire Retardant Behaviour**  
*Ulrike Braun, BAM Federal Institute for Material Testing, Germany*

10.15 - 10.45 **Fire Retardant Behaviour of Composites**  
*Professor Baljinder Kandola, University of Bolton, UK*

10.45 - 11.15 **Refreshments, Exhibition and Posters**

11.15 - 11.45 **The Effect of Fire Retardants on the Physical Properties of Polymers**  
*Dr John Liggat, University of Strathclyde, UK*

11.45 **Session 2: Fire Retardant Strategies**

11.45 - 12.15 **Gas Phase Flame Retardants**  
*Dr Sergei Levchik, ICL-IP, USA*

12.15 - 13.00 **Lunch, Exhibition and Posters**

13.00 - 14.00	<b>UCLan Fire Laboratory Tours, Exhibition and Posters</b>
14.00 - 14.30	<b>Fire Retardancy of Novel Hydrated Alumina in EVA</b> <i>Professor José-Marie Lopez Cuesta, Centre des Matériaux des Mines d'Alès (C2MA/EMA), Institut Mines Telecom (IMT), France</i>
14.30 - 15.00	<b>Phosphorus Compounds as Condensed Phase Flame Retardants for Polymer-based Materials</b> <i>Professor John R Ebdon, Polymer Centre, University of Sheffield, UK</i>
15.00 - 15.30	<b>Refreshments, Exhibition and Posters</b>
15.30 - 16.00	<b>Novel Nanocomposite Fire Retardants</b> <i>Professor Giovanni Camino, Politecnico di Torino, Italy</i>
16.00 - 16.30	<b>Synthesis and Mechanism of Flame Retardant Microencapsulation and Inorganics Additives</b> <i>Professor Yuan Hu, State Key Laboratory for Fire Science, University of Science and Technology of China, China</i>
16.30 - 17.00	<b>Layer by Layer Assembly: A Current Emerging Technique for Conferring Flame Retardancy</b> <i>Dr Jenny Alongi, Politecnico di Torino, Italy</i>
17.00 - 18.00	<b>UCLan Fire Laboratory Tours, Exhibition and Posters</b>
19.00	<b>Coaches to Conference Cocktail Reception at Houghton Tower</b>
19.30 - 20.30	<b>Conference Cocktail Reception at Houghton Tower</b>
20.30 - 22.30	<b>Conference Dinner at Houghton Tower</b>
23.00	<b>Coaches return guests to UCLan</b>

## Wednesday 16<sup>th</sup> April

08.30	<b>Refreshments available by the Registration Desk</b>
09.00 - 09.30	<b>Intumescence: A Versatile Concept for Diverse Applications</b> <i>Professor Serge Bourbigot, Unité Matériaux et Transformations, ENSC Lille, France</i>
09.30	<b>Session 3: Applications of Fire Retardants</b>
09.30 - 10.00	<b>Developments in Fire Resisting Intumescent Coatings for Structural Steel</b> <i>Dr Andrew P Taylor, Sherwin-Williams, UK</i>

10.00 - 10.30	<b>Recent Developments in N and P Based Flame Retardants</b> <i>Dr Sabyasachi Gaan, Empa, Switzerland</i>
10.30 - 11.00	<b>Refreshments, Exhibition and Posters</b>
11.00 - 11.30	<b>Industrial Applications of Flame Retardants for Thermoplastics</b> <i>Dr Martin Klatt, BASF SE, Germany</i>
11.30 - 12.00	<b>Development and Characterization of Low-Combustibility Polymer Materials for Aircraft Applications</b> <i>Dr Richard Lyon, FAA, USA</i>
12.00 - 12.45	<b>Lunch, Exhibition and Posters</b>
12.45 - 13.45	<b>UCLan Fire Laboratory Tours, Exhibition and Posters</b>
13.45	<b>Session 4: Testing, Toxicity and the Environment</b>
13.45 - 14.15	<b>Fire Safety Regulations and Testing - Their Impact on the Use of Polymers and Flame Retardants</b> <i>Dr Jürgen H Troitzsch, Fire &amp; Environment Protection Service FEPS, Germany</i>
14.15 - 14.45	<b>Fire Retardants and Fire Smoke Toxicity</b> <i>Dr Anna A Stec, University of Central Lancashire, UK</i>
14.45 - 15.15	<b>Environmental Concerns Regarding Chemical Flame Retardants</b> <i>Professor Heather M Stapleton, Duke University, USA</i>
15.15 - 16.00	<b>Refreshments and Symposium Ends</b>
16.00 - 17.00	<b>UCLan Fire Laboratory Tours</b>
<b>Thursday 17<sup>th</sup> April</b>	
09.00 - 16.00	<b>Workshop in the Darwin Lecture Theatre on ‘Replacement of Halogenated Flame Retardants in Upholstered Furnishings’ (Organised by COST-FLARETEX)</b>

## Symposium Organising Committee

Richard Hull  
Baljinder Kandola  
John Liggat  
Bruce Lane  
Ruth Lane  
Anna Stec

University of Central Lancashire, UK  
University of Bolton, UK  
University of Strathclyde, UK  
RSC Speciality Chemicals Sector  
RSC Speciality Chemicals Sector  
University of Central Lancashire, UK

### **Conference Location**

The conference is being held at the University of Central Lancashire (UCLan) in Preston. Preston is a city in the north west of England about an hour from Manchester and Liverpool. There is one major international airport – Manchester, and two others - Liverpool and Blackpool within an hour of Preston. There are direct rail links from Manchester Airport, London, and elsewhere to Preston.

A map and further information on how to get to UCLan at Preston by air, road, rail can be found at [http://www.uclan.ac.uk/visit/how\\_to\\_find\\_us.php](http://www.uclan.ac.uk/visit/how_to_find_us.php) For train bookings and schedules visit <http://www.thetrainline.com/>.

The map on the following page shows the UCLan campus. The science area of the university is situated in the blue buildings on the map. The lectures and exhibition will be held in the Darwin Building, the Fire Laboratories are in the J B Firth Building and lunches will be in The Refectory in Foster Building. The map will also be sent as part of the Joining Instructions.

### **Car Parking**

If you need car parking at UCLan you MUST let the conference secretary know by 1st April as we have to reserve spaces for named delegates in advance.

### **Tours to Commercial Fire Testing Laboratories**

Tours to local Commercial Fire Testing Laboratories are being arranged. Please contact the conference secretary if you are interested in such a tour and we will let you know availability and timings as soon as arrangements have been finalized. Coaches will take people from UCLan to the commercial facilities on the afternoon of Monday April 14th and return them afterwards in time for the welcome reception.

### **Lectures, Exhibition and Posters**

Lectures will be held in the Darwin Building Lecture Theatre. The Exhibition and Poster Display, which will run alongside the conference, will be in the foyer adjacent to the Lecture Theatre. To aid networking between delegates, exhibitors and poster presenters, the Welcome Drinks Reception on the evening of Monday 14th April, and all refreshments and after lunch coffee and tea on Tuesday 15th April and Wednesday 16th April will be served in the foyer. This will enhance the profile of the novel research from poster presenters and give delegates more opportunities to see the exhibitors stands.

If you would like to be an exhibitor or present a poster please contact the conference secretary directly.

### **Meals and Refreshments**

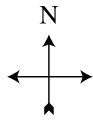
On Monday 14th April there will be a welcome drinks reception with canapés from 6.00pm to 8.00pm in the foyer of the Darwin Building.

Coffee and tea will be available in the foyer of the Darwin Building throughout the conference and lunch will be served in the Refectory in Foster Building on Tuesday 15th and Wednesday 16th April.

The conference cocktail reception and dinner on Tuesday 15th April will be at Hoghton Tower. Coaches will take delegates from UCLan to and from Hoghton Tower.

### **Shop and Refectory**

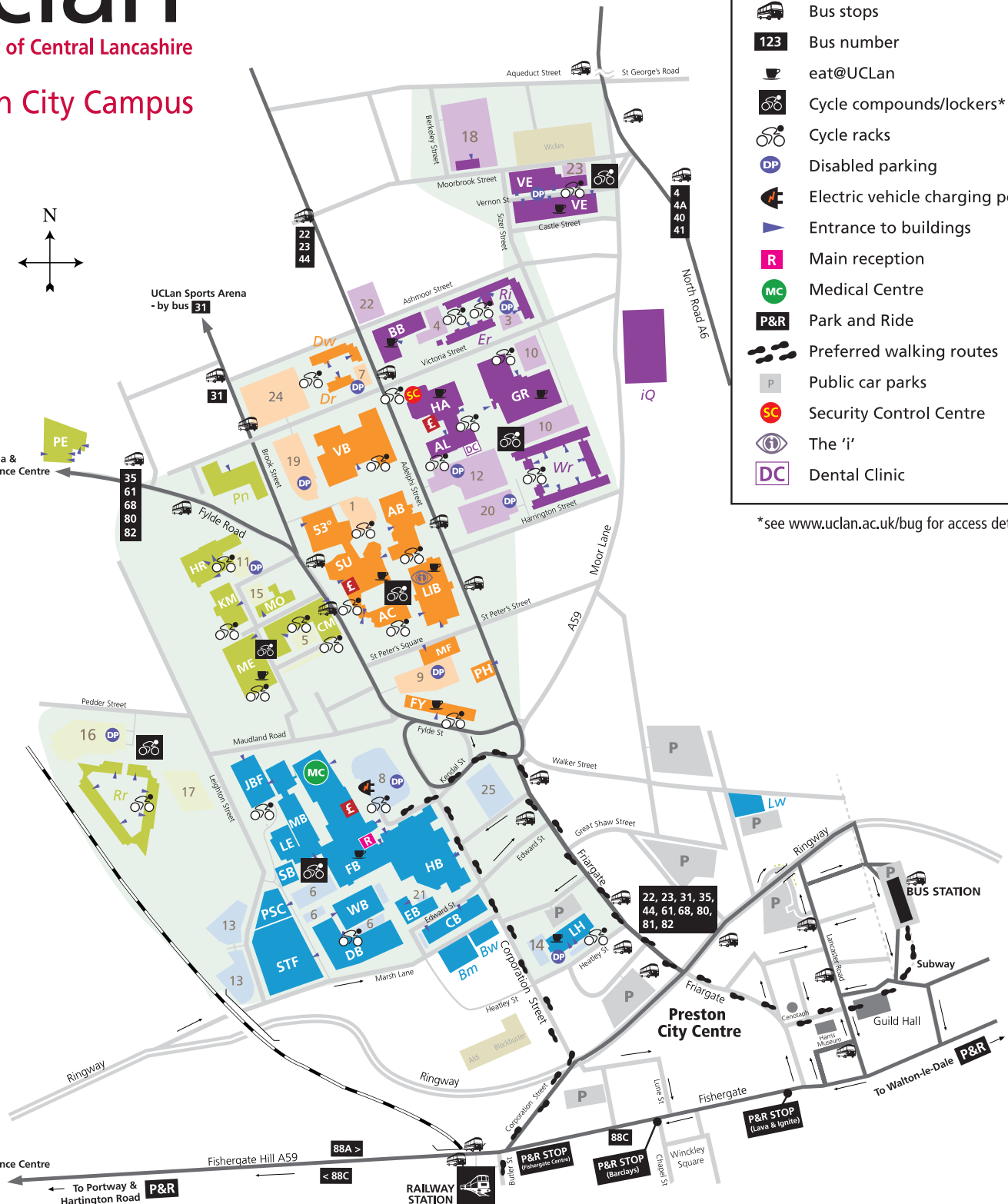
There is a shop and a restaurant (The Refectory) in the Foster Building which will be open during the conference and delegates can use as required.



UCLan Sports Arena  
- by bus 31

UCLan Sports Arena &  
Westleigh Conference Centre  
- by car (2 miles)

Westleigh Conference Centre  
- by bus 88C



### KEY

- ATM
- Bus routes
- Bus stops
- Bus number
- eat@UCLan
- Cycle compounds/lockers\*
- Cycle racks
- Disabled parking
- Electric vehicle charging points
- Entrance to buildings
- Main reception
- Medical Centre
- Park and Ride
- Preferred walking routes
- Public car parks
- Security Control Centre
- The 'i'
- Dental Clinic

\*see [www.uclan.ac.uk/bug](http://www.uclan.ac.uk/bug) for access details

#### BLUE ZONE - Harris Site

CB	Chandler Building
DB	Darwin Building
EB	Edward Building
FB	Foster Building
JBF	JB Firth Building
HB	Harris Building
LE	Leighton Building
LH	Livesey House
MB	Maudland Building
MC	Medical Centre
PSC	Pre-School Centre
SB	Stewart Building
STF	Sir Tom Finney Sports Centre
WB	Wharf Building
Bm	Boatmans Court
Bw	Bowran House
Lw	Lawson Hall
6	Darwin Car Parks
8	Foster Car Park (reserved spaces for visitors)
13	Leighton Car Parks
14	Livesey Car Park
21	Harris Car Park
25	Fylde II Car Park

#### GREEN ZONE - Media Factory Site

CM	Computing and Technology Building
HR	Hanover Building
KM	Kirkham Building
ME	Media Factory
MO	Moss Building
PE	Peel Building (Mailroom)
Pn	Pendle Hall
Rr	Roeburn Hall
5	Computing & Technology Car Park
11	Hanover Car Park
15	Moss Car Park
16	Roeburn I Car Park (Pedder Street)
17	Roeburn II Car Park (Pedder Street)

#### ORANGE ZONE - Adelphi Site

AB	Adelphi Building
AC	St. Peters Arts Centre
FY	Fylde Building
LIB	Library & Learning and Information Services (LIS)
MF	Multi-Faith Centre
PH	University Police House
SU/53*	Students' Union/53 Degrees
VB	Victoria Building
Dw	Derwent Hall
Dr	Douglas Hall
1	53* I Adelphi Car Park
7	Douglas Car Park
9	Fylde Car Park
19	Victoria Car Park
24	Victoria II Car Park

#### PURPLE ZONE - Harrington Site

AL	Allen Building
BB	Brook Building
GR	Greenbank Building
HA	Harrington Building
VE	Vernon Building
Er	Eden Hall
iQ	iQ Preston
Ri	Ribble Hall
Wr	Whitendale Hall
3	Ribble Car Park
4	Brook Car Park
10	Greenbank Car Parks
12	Harrington Car Park
18	Vernon Car Park (Berkeley Street)
20	Whitendale Car Park
22	Ashmoor Street Car Park (temporary)
23	Vernon Car Park (Moorbrook Street)



## Registration

The registration desk in the foyer of the Darwin Building, adjacent to the Lecture Theatre, will be open from 4.00pm to 7.00pm on Monday 14th April and will reopen at 8.00am on Tuesday 15th and remain open while the conference is in progress.

On registration participants will receive a name badge and a conference bag containing:-

- 1) Conference Preprints with copies of the slides of the speakers presentations and information on the posters.
- 2) A list of participants and exhibitors.
- 3) An invitation to the Cocktail Reception and Conference Dinner at Hoghton Tower.

## Accommodation

Details of hotels closest to the conference venue are given in the left hand column of the table below. Please make your own accommodation arrangements, explaining attendance at the UCLan conference to ensure access to any discount.

<p><b>LEGACY PRESTON INTERNATIONAL (nearest)</b> Marsh Lane Preston, PR1 2YF Tel 0844 4119028 Fax 0870 832 9929 <a href="http://www.legacy-hotels.co.uk">www.legacy-hotels.co.uk</a></p> <p><b>PREMIER INN PRESTON CENTRAL (city centre) (newest)</b> Fox Street Preston, PR1 2AB Tel: +44 (0) 871 527 8908 Fax: +44 (0) 871 527 8909 <a href="http://www.Premierinn.com">www. Premierinn.com</a></p> <p><b>HOLIDAY INN PRESTON (city centre)</b> The Ringway Preston Tel: +44 (0) 871 9429066 <a href="http://www.ichotelsgroup.com">www.ichotelsgroup.com</a> <a href="mailto:reservations@hipreston.com">reservations@hipreston.com</a> (Disabled Facilities available)</p> <p><b>PRESTON CENTRAL TRAVEL LODGE (near city centre) (cheapest)</b> Preston Farmers Office New Hall Lane Preston PR1 5NX Tel +44 (0) 871 9846150 Fax +44 (0)1772 794381 <a href="http://www.travelodge.co.uk">www.travelodge.co.uk</a></p>	<p><b>WEST PRESTON PREMIER INN</b> Blackpool Road Lea Preston Tel: 01772 720476</p> <p><b>PRESTON MARRIOTT (near Jct 32, M6)</b> 418 Garstang Road Broughton Preston Tel: +44 (0) 1772 864087 Fax: +44 (0) 1772 861728 <a href="http://www.marriott.co.uk">www.marriott.co.uk</a> (Disabled Facilities available)</p> <p><b>IBIS PRESTON NORTH (off Jct 32, M6/Jct 1 M55)</b> Garstang Road Broughton Preston Tel: +44 (0) 1772 861800 Fax: +44 (0) 1772 861900 <a href="http://www.ibishotel.com">www.ibishotel.com</a> (Disabled Facilities Available)</p>	<p><b>TICKLED TROUT HOTEL (Off Jct 31, M6)</b> Preston New Road Samlesbury Preston Tel: +44 (0) 1772 877671 Fax: +44 (0) 1772 877463 <a href="http://www.macdonaldhotels.co.uk">www.macdonaldhotels.co.uk</a></p> <p><b>THE PARK HOTEL</b> 209 Tulketh Road Ashton Preston Tel: +44 (0)1772 726250 <a href="http://www.theparkpreston.com">www.theparkpreston.com</a></p> <p><b>BARTON GRANGE (near Jct 32, M6)</b> Garstang Road Broughton Tel: +44 (0) 1772 862551 <a href="http://www.bartongrangelhotel.com">www.bartongrangelhotel.com</a> (Disabled Facilities available)</p> <p><b>TRAVEL INN (off Jct 31A, M6)</b> Bluebell Way Preston (East) Link Road Fulwood Preston Tel: +44 (0)8701 977215 Fax: +44 (0)1772 651619 <a href="http://www.travelinn.co.uk">www.travelinn.co.uk</a></p>
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More local and hotel information can be obtained from the Preston Tourist Information Centre, tel: 01772 253731, email: [tourism@preston.gov.uk](mailto:tourism@preston.gov.uk); [www.visitpreston.com](http://www.visitpreston.com)

## **Taxis**

Local Taxi information: New City Taxis tel: 01772 824000  
AAA Taxis tel: 01772 555111

## **Information on Hoghton Tower location of the Conference Cocktail Reception and Dinner**

The de Hoghton family has lived in the area for over a millennium and the family name became Hoghton in the reign of Queen Elizabeth I and the magnificent Hoghton Tower was built.



Hoghton Tower



The Banqueting Hall showing the King's Table and the Minstrel's Gallery



Please contact Ruth Lane ([ruth@cowlane.co.uk](mailto:ruth@cowlane.co.uk)) if you would like to

**SPONSOR**

**EXHIBIT**

**OR PRESENT A POSTER ON CURRENT RESEARCH**

**THERE WILL BE A PRIZE FOR THE BEST STUDENT POSTER**

## **REGISTRATION FEES**

<b>Standard Rate</b>	<b>£600</b>
<b>RSC/SCI members or COST MP1105 industry members</b>	<b>£500</b>
<b>Students or EU COST MP1105 research members</b>	<b>£200</b>
<b>Students Presenting a Poster</b>	<b>£150</b>
<b>Speakers</b>	<b>Free</b>

**Registration is open at <http://tinyurl.com/frt2014>**

**Conference Secretary:-**

Dr Ruth M Lane, e-mail: [ruth@cowlane.co.uk](mailto:ruth@cowlane.co.uk)

Up to 12<sup>th</sup> April: tel/fax: +44 (0) 1928 788071;

12<sup>th</sup>–17<sup>th</sup> April only, mobile number +44 (0) 7935 448 264 or +44 (0) 7935 275 444