

14TH INTERNATIONAL SYMPOSIUM ON FIREWORKS

第十四届国际烟花论坛



OCTOBER, 14-18, 2013
CHANGSHA, CHINA
长沙, 中国



PROGRAM



www.NATIONALFIREWORKS.org

OUR MISSION

The mission of the NFA is to work diligently to ensure that the Fireworks Industry is regulated in a fair and sensible manner. We promote Safety within the industry and to the Consumers that use our products. The NFA was established to serve the members no matter whether a company or an individual. The NFA promotes the Safe Use of Fireworks in all sections of the industry.

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BRANSON, MISSOURI USA

Message from the ISF Society Chairman *Ettore Contestabile*

Dear ISF Attendees,

It was nineteen years ago in the week of Oct 24-28 at the 2nd International Symposium on Fireworks (ISF) in Vancouver, that I came to realize the potential impact that the Chinese firework researchers could have on the fireworks industry. Following this ISF there was a continual stream of papers from Chinese researchers and regulators that were submitted at every ISF for presentation. One can follow the evolution of the marketing, testing methods, quality control, standards development and dissemination and enforcement of new regulation, just by reading the papers in the past ISF Proceedings. Parallel to this emerging market of quality products was the quest for recognition. Since 1996, the Chinese enquired as to when the ISF would consider China as its next destination. Well, it took some time but we are here!

The round of the ISF Hosting Proposals which occurred just before the Malta ISF resulted in the China proposal receiving the most votes by the ISFS Directors. Therefore, at the Malta ISF gala dinner, it was announced that the 14th ISF would be held in Changsha in the fall of 2013. Mr. Tang Xianhua, Director of Liuyang Fireworks Administration Bureau, accepted the traditional handing-over of the ISF Co-Chair name badge which will be worn by the official local ISF Co-Chairman.

The ISFS recognized not only the efforts of every Chinese author/speaker who participated in past ISF's but also, the efforts of Mr. Andrew Tang, Director of Liuyang Fireworks General Association and General Manager of Tian Cheng Pyrotechnics Laboratory, who was relentless in his pursuit to help the Chinese in their successful bid to host the ISF. Andrew facilitated not only the organization/logistics for the ISF in China but was also instrumental in assisting with the many papers submitted to the ISF Program from China.

We have received over seventy papers from authors in China. Some papers have been withdrawn as authors decide that they cannot commit to attending the ISF but the Program is well populated by Chinese authors/speakers. There are very good technical papers and many that relate to the struggle to improve the quality of fireworks while increasing safety in manufacture and use of fireworks. In addition, I was pleasantly surprised at the philosophy presented by various authors on the history of fireworks in China and how deeply interwoven they are with their culture. In fact, one author took a further step and implies that the use of fireworks around the world may be surviving as a result of Chinese living abroad who demand that fireworks are needed in maintaining their cultural celebrations outside of China.

I was so impressed with some of their philosophy that I thought that you would appreciate to read a few of these ideas from papers being presented at this ISF. I can just imagine how much better the wording must be in the Chinese version of this text!

From the paper, *The Color Coordination and Artistic Expression of Fireworks*, by Wei Chenyan and Tang Yuehua,
"The firework art gradually becomes a source of spiritual nourishment that any other variety of art cannot replace."

From the paper, *The Culture, Science of Fireworks in China and its Innovation in the Future*, by Pan Gongpei,
"With the crisp sound, bright colors and fragrance they always bring us to another world of spirit, suddenly giving a newborn baby the most holy baptism, the wedding couple a most sincere promise, the dead most sacred souls, battle athletes' best blessings and the triumph of the soldiers' warmest welcome. All happiness sadness can release the most heartily..., so great is the charm of the spiritual wealth."

And,

“Fireworks have always been in existence, from the date of their birth through thousands of years while suffering much, but always ingrained and grounded in the dragon heart, continuously affecting the whole world. Today, no matter which country, which one ethnic people, of all ages and both sexes, whether in the city or in the country, as long as a discharge of fireworks can be put together, all cheer happily, all have the same kind of lingering complex”

From the paper, *brief Discussion on the Technological Innovation of Fireworks*, by Li Zhongqi, *“We should make general reforms, worship art and refinement, and prepare for danger in times of safety, and transform adversity into opportunity. It is the necessary way for fireworks industry to break through the dilemma to grasp fireworks technology innovation.”*

These and many other words of wisdom are bound in the ISF Proceedings. Along with the latest research and advances in the field of fireworks there are papers on the development of standards that are designed to support and sustain a healthy fireworks industry.

Again, we thank the authors for their effort. The many papers submitted to this edition of the ISF were edited by the people listed below. The effort of the editors is reflected in the high quality of the papers and they must also be given credit for their diligence, time and knowledge of the topics submitted. I personally read, edited and formatted every paper with Bert von Rosen performing the final assembly of the Proceedings.

As usual, it takes a great effort to deliver the Symposium, requiring dedication from many volunteers. This Symposium had logistic support from the China ISF Host Committee and we are indebted to them all for their support.

Once again we would like to thank all the sponsors and encourage others to promote the Symposium and their business through sponsorship.

The ISF is proud to be hosted in the land where bamboo crackers developed into the art and tradition of fireworks entertainment, a foundation sustaining our great adventure in Discovering the Fire – ΕΞΕΥΡΙΣΚΕΤΕ ΤΟ ΠΥΡ !

Ettore Contestabile
ISF Society Chairman

国际烟花论坛协会主席 *Ettore Contestabile* 的信

国际烟花论坛各与会者：

19年前的10月24至28日这一周，在温哥华举办的第二届国际烟花论坛上，我开始意识到中国烟花研究者对烟花产业的潜在影响力。这次论坛过后，在各届国际烟花论坛上，中国研究员和调整者的论文如潮水般涌来。我们只需阅读过去几届国际烟花论坛上的论文就可以追踪营销、检测方法、质量控制、标准制定与传播、新规实施等方面的演变过程。伴随优质产品新兴市场的是中国人渴望得到认可。1996年以来，中国人不断询问国际烟花论坛何时将在中国举办。哦，这需要一点时间，但是我们就在这里。

在马耳他国际烟花论坛之前有一轮谁当主办方的提议，结果是将中国作为主办方的提议得到了大多数国际烟花论坛协会董事的支持。因此，在马尔他国际烟花论坛庆祝晚宴上，宣布了第 14 届国际烟花论坛将于 2013 年秋季在长沙举办，与浏阳鞭炮烟花管理局局长汤显华进行了国际烟花论坛联合主席姓名徽章的传统交接，该徽章由当地正式的国际烟花论坛联合主席佩戴。

国际烟花论坛协会不仅认可每位参与了先前国际烟花论坛的中国作者/发言人的努力，还认可湖南天诚烟花检验所总经理兼浏阳烟花总会理事长邓善均先生的努力。邓善均先生不懈的追求，帮助中国成功地获得了国际烟花论坛的主办权。邓善均不仅为国际烟花论坛在中国举办提供了组织/物流等方面的便利条件，而且对呈交给国际烟花论坛的多篇中国论文提出了帮助性建议。

我们收到了来自中国作者的 70 多篇论文。部分作者因为决定不参加国际烟花论坛而撤回了他们的论文，但是该论坛充斥着中国作者/发言人。他们写出了优质技术论文，许多涉及到如何努力提高烟花质量，同时提高烟花生产和使用过程中的安全性。另外，许多作者对中国的烟花历史以及烟花与文化之间扯不断的联系发表了他们的哲学观点，对此我感到又惊又喜。事实上，一位作者进一步指出，因为海外中国人需要用烟花弘扬其文化庆祝传统，所以世界范围内烟花的使用可能不会消失。

他们的某些哲学观点给我留下了深刻印象，我认为您读一读本届国际烟花论坛论文中的某些观点，一定会感到赏心悦目。我只能想象，中文版本的措辞一定比这优美得多！

如危成焰和汤跃华在论文《焰火色彩搭配与艺术表现》中写道：“烟花艺术逐渐成为滋润心灵的源泉，这是任何其他艺术形式所无法替代的。”

潘功配在论文《中国烟花爆竹的文化、科学与发展创新的未来》中写道：“在当今的人类社会活动中，大至国家庆典，小至民间婚丧喜庆，烟花爆竹已不可或缺，其清脆的爆响、鲜艳的色彩和芬芳的气味，总是一下子将我们的意境带入到另一个精神世界：初生的婴儿施以了最圣洁的洗礼；新婚的夫妇许下了最真挚的诺言；逝者的亡灵受到了最神圣的超度；出征的健儿得到了最美好的祝福；凯旋的将士受到了最热烈的欢迎；一切喜庆悲愿都能得到最尽情、最酣畅的宣泄…，其精神财富的魅力如此之大。”，“烟花爆竹自诞生之日起历经千年沧桑，却始终根深蒂固地植根于龙的传人心底，并影响着整个世界。今天世界上无论哪一个国家哪一个民族男女老少，无论是城里人还是乡下人，只要烟花爆竹一燃放都能聚集到一起，都喜笑颜开的欢呼，都有同一种挥之不去的情结”。

黎仲畦在论文《浅谈烟花爆竹科技创新》中写道：“革故鼎新，崇艺求精，居安思危，化危为机。抓好花炮科技创新，是行业走出困境的必然之路，我们应该清醒的看到，随着环境、条件，市场的变化，燃放的空间变小，对花炮的要求也越来越高，规格大，药量多（安全隐患也大）的花炮产品将受到更严格的控制，我们必须遵循时代发展的规律，顺应发展的潮流，从花炮原材料的开发制作、工艺的改变到产品结构的调整，进行革新，”

在国际烟花论坛上涌现出了这些论文以及其他充满智慧的话语。伴随着烟花领域的最新研究与进展，涌现了关于制定标准的论文，这些标准的设计是为了支持和维护健康的烟花行业。

我们再一次感谢作者所付出的努力。本届国际烟花论坛上的多篇论文是由下列人员编辑的。从论文的高质量中可以看出编辑们付出的努力。对于他们的辛勤劳动、付出时间及对主题的渊博知识，我们必须给予赞美。我个人与 Bert von Rosen 一道阅读和编辑了每篇论文并为它们设计了版式，执行了日程表中的最后一次集会。

和通常一样，举办论坛需要付出很大的努力，需要多名志愿者的奉献。本次论坛得到了来自中国国际烟花论坛主办委员会的后勤支援，我们对他们的支持表示感谢。

我们再一次感谢所有的赞助者，鼓励他人通过赞助推动论坛及他们企业的发展。

在对火的发现做了伟大探索、将爆竹发展成艺术形式和娱乐传统的国度举办国际烟花论坛，是一件让人十分自豪的事情。

国际烟花论坛协会主席
Ettore Contestabile

Welcome from:

Mr. Yu Xunwei, Honorary Chairman of the 14th International Symposium on Fireworks



Enhance Cooperation for Common Development

Liuyang Fireworks is one of the most famous fireworks brands worldwide. Liuyang is the largest production and trade base of fireworks in the world, and is awarded as Home of Fireworks of China by the state. Now there are 1024 fireworks and crackers enterprises, accounting for 70% of production capacity nationwide, 60% of total export volume and 50% of domestic sales volume. After inheritance and development of a millennium, Liuyang Fireworks has completely transformed from a traditional manufacturing industry into a modern cultural industry. International Symposium on Fireworks is a globally reputable academic exchange platform for fireworks, and has made significant contributions to promoting sound and sustainable development of fireworks industry worldwide. The 14th Session of International Symposium on Fireworks is held for the first time since its foundation in China and Liuyang, where fireworks originate. It enables manufacturers and retailers worldwide to get a full understanding over Liuyang Fireworks, also acts as a unique yet distinctive window to display Liuyang Fireworks to the world. It gathers the updated development fruits of fireworks industry worldwide, thus becoming a grand meeting that combines multiple cultures and glitters the lights of wisdom. With the 14th Session of International Symposium on Fireworks, we shall build up a bridge of exchange and cooperation between Liuyang Fireworks and fireworks of the world, so as to create a win-win result.

It is our common goal to enhance cooperation and seek mutual development. On the occasion, I sincerely hope that celebrities in the circle of fireworks both at home and abroad will make use of the platform to enhance communication and exchange, create more sparks in academics and achieve more cooperation fruits, so as to make bigger contributions to the fireworks industry of China and the world. It is hoped that Liuyang Fireworks would take advantage of the grand meeting to discover new opportunities, make new breakthroughs and create greater success.

Finally, I sincerely wish complete success to the 14th Session of International Symposium on Fireworks.

加强合作，共谋发展

余勋伟 - 第十四届国际烟花论坛中方名誉主席

浏阳花炮响天下，天下花炮数浏阳。浏阳是全球最大的烟花爆竹生产贸易基地和国家命名的“中国花炮之乡”，现有烟花爆竹企业 1024 家，产能占全国的 70%，出口总额占全国的 60%，内销占全国的 50%。浏阳花炮历经千年传承和发展，实现了传统手工业到传统制造业再到现代文化产业的完美嬗变。国际烟花论坛是全球烟花爆竹行业中久负盛名的重要学术交流平台，对推动全球烟花爆竹产业健康持续发展作出了重大贡献。第十四届国际烟花论坛是国际烟花论坛理事会成立以来首次在中国且在花炮发源地浏阳举办，它让各国生产和销售商全面了解浏阳花炮，是一个向世界展示浏阳花炮独特魅力的窗口；它让全球烟花爆竹行业发展的最新成果汇聚浏阳，是一场融合多元文化和闪耀智慧之光的行业盛会。通过第十四届国际烟花论坛，我们将架起一座浏阳花炮与世界烟花交流合作、双赢共进的桥梁。

加强合作，共谋发展是我们的共同目标。在此，衷心希望国内外花炮界的仁人志士充分利用这个平台，加强沟通与交流，碰撞出更多的学术火花，达成更丰硕的合作成果，为推动中国乃至全球的烟花行业发展作出新的更大贡献。希望浏阳花炮行业能够借助此次行业盛会发现新机遇、取得新突破、创造新佳绩！

最后，衷心祝愿第十四届国际烟花论坛取得圆满成功！

Letter from: Lu Binghui, President of Liuyang Fireworks General Association



The International Symposium on Fireworks (ISF) is the top grand event of the international fireworks industry and plays an important role in promoting the development of the international fireworks industry. Those practitioners in the fireworks industry of Liuyang had been expecting an international fireworks form in Liuyang, Changsha. Now the International Symposium on Fireworks is moving to the major

production area of fireworks for the first time eventually, which really dramatically encourage and excite the circle of the fireworks in Liuyang. The 14th International Symposium on Fireworks (ISF) held in Liuyang, Changsha will not only construct a platform for academic communications of both domestic and foreign scholars but also establish a bridge for trade cooperation among those national and overseas enterprises producing and distributing fireworks.

As the largest major area producing fireworks in the world, Liuyang will take this opportunity to fully display the profound brand and cultural connotations of fireworks in Liuyang, timely grasp the latest technical achievements of the production and distribution of fireworks in the world, and facilitate the steps of fireworks in Liuyang to going abroad and towards the globe. As the chairman of the Liuyang Fireworks General Association, I am deeply honored for assisting to hold this summit by our General Association. I believe that this summit activity will bring far-reaching influences on enhancing the international influences as well as expediting the healthy development of the exportation of Liuyang fireworks.

Riding the wind of the 14th International Symposium on Fireworks, let us join hands with each other to strive for the beautiful future of the international fireworks industry.

卢炳辉 - 浏阳烟花爆竹总会会长，第十四届国际烟花论坛中方副主席

国际烟花论坛是世界烟花爆竹行业的顶尖盛会，对全球烟花爆竹产业的发展具有重要推动作用。浏阳花炮业界一直期待能在长沙浏阳举办一届国际烟花论坛。如今，国际烟花论坛终于首次移师主产区，这让浏阳花炮业界倍受鼓舞、倍感振奋。第十四届国际烟花论坛在长沙浏阳举办，不仅为国内外专家学者构筑了学术交流的平台，更为国内外烟花爆竹生产企业、经营公司搭建了经贸合作的桥梁。作为全球最大花炮主产区，浏阳将借此契机充分展示浏阳花炮深厚的品牌文化底蕴，及时掌握世界烟花生产和销售的最新技术成果，加快浏阳花炮走向国门、走向世界的坚定步伐。作为浏阳市烟花爆竹总会会长，我为总会这一行业组织能协办此次论坛而深感荣幸。相信此次论坛活动对于扩大浏阳花炮国际影响力，促进浏阳出口烟花健康发展将具有深远影响。

乘着第十四届国际烟花论坛的东风，让我们一起携起手来，为开创世界烟花爆竹行业的美好未来而努力！

THE 14TH INTERNATIONAL SYMPOSIUM ON FIREWORKS COMMITTEE

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SYMPOSIUM WEEK AT A GLANCE

论坛行程表

October 14-18, 2013

	Sunday 13 (日)	Monday 14 (一)	Tuesday 15 (二)	Wednesday 16 (三)	Thursday 17 (四)	Friday 18 (五)
Time 时间		Registration Trade Show Until 17:00 展覽館 17:00 止	Trade Show Until 17:00 展覽館 17:00 止	Trade Show Until 12:00 展 覽館 17:00 止	Trade Show Until 17:00 展覽館 17:00 止	Trade Show Until 12:00 展覽館 17:00 止
8:30		OPENING	Presentations 演示	Presentations 演示	Presentations 演示	Presentations 演示
10:00		Break 小休	Break 小休	Break 小休	Break 小休	Break 小休
10:30		Presentations 演示	Presentations 演示	Moderated Sessions 讨论会	Presentations 演示	Presentations 演示
12:00		Lunch 午餐时 间	Lunch 午餐时 间	CLOSE	Lunch 午餐时 间	CLOSE
13:00	Registration 报到	Presentations 演示	Presentations 演示		Presentations 演示	
13:30		Break 小休	Break 小休		Break 小休	
15:00		Presentations 演示	Presentations 演示		Presentations 演示	
15:30		CLOSE	CLOSE		CLOSE	
17:00						
18:00						
19:00	Welcome Reception 欢迎酒会					Optional: Gala Dinner 闭幕晚宴

October 18th: Friday, Gala Dinner

Time: 18:30

Site: Xihu Restaurant in Changsha

10月18日 星期五, 时间: 18:30

活动内容: 第十四届国际烟花论坛闭幕礼暨招待晚宴

地点: 长沙西湖楼酒家

SYMPOSIUM PROGRAM SCHEDULE

MONDAY: October 14

8:30 Official Opening

Ettore Contestabile, ISF chairman

Honorary Chairman: *Mr. Yu Xunwei*, Mayor of Liuyang Municipal Government

Guest Speakers

Mr. Lu Binghui, President of Liuyang Fireworks General Association

9:00 **A Study of Chinese Traditional Fireworks** - *Ouyang Xuefeng*, Jizhen Coal Mine, Hunan, China

9:30 **Consolidate Existing Ports, Open Up New Channels, Promote Chinese Fireworks Export Transportation Vigorously** - *Chen Zhengcai*, Ministry of Transportation Bureau, Waterway, China

10:00 BREAK

Session 1

Session Chairperson: *Tan Aixi*, Director of Liuyang Office of Hunan Entry- Exit Inspection and Quarantine Bureau, China

10:30 **Failure Rates of Consumer Fireworks – Testing Experiences by the Notified Body BAM** - *Christian Lohrer, Heidrun Fink, and Lutz Kurth*, Federal Institute for Materials Research and Testing (BAM), Germany



11:00 A Proposed Modification of the US Flash Composition Test to Measure both Detonation and Deflagration Properties - *Spencer C. Watson*, US Department of Transportation, *David A. Pier*, MP Associates, Inc., USA

11:30 Discussion on Mechanization of Fireworks Industry - *Huang Jiangyou*, Fireworks Administration Bureau of Liuyang, Hunan, China

12:00 LUNCH

Session 2

Session Chairperson: *Pierre Thebault*, Co-convenor of CEN/TC 212 WG2, Etienne Lacroix Tous Artifices S.A., France



13:30 Injury Potential from Rockets: Investigation of a Severe Injury by a Firework Rocket - *Shulin Nie and Mikael Ekeberg*, MSB, Swedish Civil Contingencies Agency, and *Reine Adolfsson*, FOI, Swedish Defence Research Agency, Sweden

14:00 Safety Distances for Storage Sites of Fireworks in the Netherlands - *Soedesh Mahesh and Piet Timmers*, RIVM, National Institute for Public Health and the Environment Centre for Environmental Safety and Security, The Netherlands

14:30 A Brief Introduction to Fireworks Safety Laws, Regulations, and Standards - *Huang Chaxiang and Fang Zhao*, Hunan Fireworks Safety & Quality Supervision and Testing Center, Liuyang, Hunan, China

15:00 BREAK

Session 3

Session Chairperson: *Dr. Dietrich Eckhardt*, BAM, Head of Explosives Division, Germany

15:30 The Language of Pyrotechnic Effect Names, Part 2 - *Will Harvey*, Finale Fireworks, USA



16:00 More on the Behavior of Waterfalls – *Ed G. de Jong*, Netherlands Organization for Applied Scientific Research (TNO), The Netherlands

16:30 Study on the Safe Transport of Fireworks - *Huang Chaxiang and Fang Zhao*, Fireworks Safety and Quality Supervision and Testing Center of Hunan, Hunan, China

17:00 How to Reduce the Impact of Smoke on the Fireworks Display - *Ge Guangming*, Fireworks Administration Bureau of Liuyang, Hunan, China

CLOSE

TUESDAY: October 15

Session 4

Session Chairperson: *Jorge Mauro Márquez Márquez*, Lux Pirotecnia, S.A. de C.V., Mexico



8:30 Analysis of HCB Contained in Fireworks - *Zhang Guanghui, Tan Aixi, Jiang Fangming, Qiu Lina, and Tanjingru*, Fireworks & Firecracker Inspection Centre of Hunan

Entry-Exit Inspection and Quarantine Bureau, China, and *Y S Chua*, International Quality Assurance B.V., China

9:00 Round Robin Test for Height Measurements of Various Pyrotechnics within the Forum of Notified Bodies in Europe - *Marianne Douet and Christian Lohrer*, Federal Institute for Materials Research and Testing (BAM), *Michel Lefebvre*, Centre de Contrôle de Carnelle Asbl (CECOC), Belgium



9:30 Measurement and Verification of the Fireworks Height - *Andy Tang, Paul Peng, Jolly Zou, and Andrew Tang*, Tian Cheng Pyrotechnics Laboratory, China

10:00 BREAK

Session 5

Session Chairperson: *Will Harvey*, Finale Fireworks, USA

10:30 The Ideal Competition – Setting New Standards! - *Anders Hållinder and Martin Hildeberg*, Göteborgs FyrverkeriFabrik, Göteborg, Sweden



11:00 Categorization and Classification of Fireworks Competitions Awards: The International Pyro-Ranking Project - *Mikel Pagola Erviti*, Valencia, Spain

11:30 The Culture, Science of Fireworks in China and its Innovation in the Future - Pan Gongpei, Nanjing University of Science and Technology, Nanjing, China

12:00 LUNCH

Session 6

Session Chairperson: *Paul McKinley*, MagicFire, USA

13:30 When Pyrotechnics Developed from Crafts to Professionalism and Science: What can be learned from the Works of the Ruggieri Family? - *Pierre Thébault*, Etienne Lacroix Tous Artifices S.A., Mazerès, France

14:00 Study on a Deodorant Material for Sulphur Dioxide - *Zhang Youshan and Huang Jiangyou*, China

14:30 Discussion of Wedding Celebration Culture and Fireworks Art - *Li Shifei*, MPA, Fireworks Process Artist and Human Resources Management Master, China

15:00 BREAK

Session 7

Session Chairperson: *Anders Hållinder*, Göteborgs FyrverkeriFabrik, Göteborg, Sweden



15:30 How Can Airbag Ignition Technology Improve Firework Safety and Synchronisation in Pyro-Musical Displays? - *Frederic Manzi and Dominique Vignolo*, Vishay Sfernice, France

16:00 Science and Technology are the Safety Guarantee of Fireworks - *Liu Chunwen*, Nanchang Anda Security and Technology Consulting Co. Ltd., Jiangxi, China

16:30 Progress of ISO/TC264 'Fireworks' – *Dietrich Eckhardt*, Federal Institute for Materials Research and Testing (BAM), Germany

17:00 Study and Application of New Environmentally Friendly Outer Cylinder of Firework Manufactured by Mold Pressing - *Huang Guanghui, Liu Gang, Zhong Jihao, Pan Jianglu*, Liuyang Yihelong Fireworks Manufacturing Co., Ltd., Liuyang City, Hunan, China, and *Pan Gongpei*, Nanjing University of Science and Technology, Nanjing, Jiangsu, China

CLOSE

WEDNESDAY: October 16

Session 8

Session Chairperson: *Ye Fen*, Hunan Jinsheng Fireworks Co., Ltd, China

8:30 Impact of Ambient Air Quality by Outdoor Fireworks Displays in Hong Kong -
Andrew Tang, Tian Cheng Pyrotechnics Laboratory, Liuyang, China, *Wilson Mao*,
Pyromagic Multi-media Productions Ltd., Hong Kong

9:00 Fireworks and Particulate Matter (PM_{2.5}) - *Huang Chaxiang and Yang Lin*, Hunan
Fireworks Safety & Quality Supervision and Testing Center, Liuyang, Hunan, China

9:30 Study on the Construction of ISO Fireworks Standard System - *Tan Aixi, Zhang
Guanghui, Xiao Jiayong, Qiu Lina*, Fireworks & Firecracker Inspection Centre of Hunan
Entry-Exit Inspection and Quarantine Bureau, China

10:00 BREAK

Session 9

Session Chairpersons: *Jorge Mauro Márquez Márquez*, Lux Pirotecnia, S.A. de C.V., Mexico
Huang Jiangyou, Liuyang Fireworks Administration Bureau

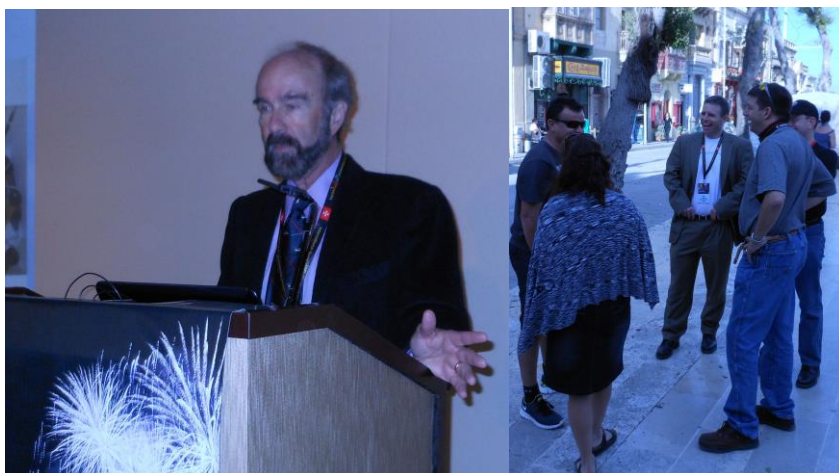
Moderated Sessions

10:30 – 12:00

Each of the moderated session topics listed below will be assigned to a designated table. The number of participants at each table will be limited. Symposium attendees wishing to take part in the discussion of a particular topic will be required to register with the respective moderator. This should be done prior to 9:00 on Wednesday.

Each topic will be presented for discussion in two separate, 45 minute sessions, with a break between. This will provide participants the opportunity to attend two different topics, if they wish. Note that translation services will not be available for the moderated sessions; however, some moderators can converse in more than one language.





Topics and Moderators

Measurements of burst and effect heights of fireworks, Christian Lohrer

The carbon footprint of fireworks, Roger L. Schneider

Computer Choreography, Will Harvey

Inventory management and equipment management, Chris Hondl

Risk Assessment and the T-Connector - Look Closely!! Robert Foti

Environmental impact of fireworks, Ben Schwegler

Fireworks explosions and detonations, Ettore Contestabile

From labor intensive to machine automation of fireworks manufacturing, Huang Guanghui

12:00 CLOSE – Free Afternoon

THURSDAY: October 17

Session 10

Session Chairperson: *Zhong Juan*, Director of Foreign Trade Department of Dancing Fireworks Group Co., Ltd, China

8:30 Brief Introduction to the Informatization Management of Fireworks Enterprises -
Zhong Yong and Li Du, Liuyang Yindali Fireworks Discharge Co., Ltd., China

9:00 Enlightening Effect of Music on the Structure of Fireworks -
Tang Yongqiang, School of Music of Hunan Normal University, Changsha, Hunan, Chin

9:30 Research and Application of Testing Skill of Fireworks Industry -
Zhang Xiaocheng and Deng Yuqun, Jiangxi Lidu Fireworks Corporation, Nanchang City, Jiangxi Province, China

10:00 BREAK

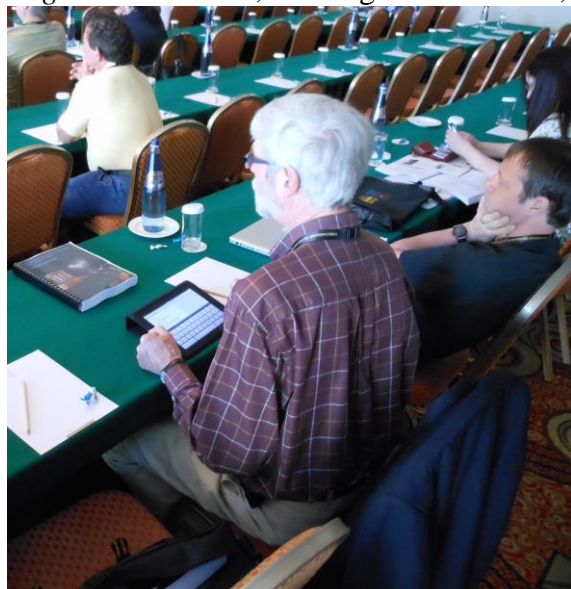
Session 11

Session Chairperson: *Andrew Tang*, President of Hunan Tian Cheng Pyrotechnics Laboratory, China

10:30 Magnetic Chronographic Muzzle Velocity Measurement, Part I, Theory of the Magnetic Chronograph and Applications in the Fireworks Industry - *Susan C. Schneider*, Marquette University, USA, *Roger L. Schneider*, Rho Sigma Associates, Inc., USA, and *Paul McKinley and George Bossarte*, MagicFire, USA



11:00 Magnetic Chronographic Muzzle Velocity Measurement, Part II, Design, Construction, Testing And Applications of a Magno-Chronograph - *Paul McKinley and George Bossarte*, MagicFire, USA, *Susan C. Schneider*, Marquette University, USA, and *Roger L. Schneider*, Rho Sigma Associates, Inc., USA



11:30 A Proposed Mechanism for Fire Spread in Firework Stores - *G. Atkinson and S. G. Myatt*, Health and Safety Laboratory, Great Britain

12:00 LUNCH

Session 12

Session Chairperson: *E.G. de Jong*, Project Manager, Netherlands Organization for Applied Scientific Research (TNO)

13:30 Assessment of Pyrotechnic Smoke Emissions with CFD Tools - *Christian Lohrer and Abdelkarim Habib*, Federal Institute for Materials Research and Testing (BAM), Germany

14:00 Predicting and Analysing Smoke Movements using ArcGIS Software - *Nicholas Spiteri*, FireOne Malta, Malta

14:30 Effect of Water Content on Fireworks Safety - *Qiu Zhixiong*, National Fireworks Safety and Quality Supervision and Testing Center, Hunan, China



15:00 BREAK

Session 13

Session Chairperson: *Pan Gongpei*, Professor of Nanjing University of Science and Technology, China

15:30 Research on Whistle Compositions for Fireworks - *Yang Lin and Zhang Jiang*, Fireworks Safety & Quality Supervision and Testing Center of Hunan, Liuyang, Hunan, China

16:00 A Preliminary Study of the Regulation of Safety and Technology for Stadium Fireworks Shows - *Luo Jianshe*, Public Security Bureau of Liuyang City, Hunan, China, *Gong Xiangyun*, Public Security Bureau of Hunan, Changsha, China, and *Francis Wu*, Hong Kong Glorious Entertainment Production Limited, Hong Kong

16:30 Discussion of Essential Skills of Fireworks Export Exhibition - *Jiang Wubin*, Hunan Fuxiang Fireworks Group, China

17:00 “One Condition Control Method” Achieves Safety Production of Fireworks and Crackers - *Qiu Congzhao*, Liuyang QuanAn Protection Appliance Manufacturing Co., Ltd., China

CLOSE

FRIDAY: October 18

Session 14

Session Chairperson: *Marianne Douet*, BAM, Germany

8:30 Brief Discussion on the Nine Major Factors Affecting the Sound Development of the Fireworks and Cracker Industry - *Wu Dixi and Fei Jinxi*, Hebei Lixian Demao Fireworks and Firecrackers Group, China

9:00 Cake Specifications Readable by Humans and Computers - *Will Harvey*, Finale Fireworks, USA

9:30 Preventing Propagation between Packaged Flash Composition Charges - *Spencer C. Watson*, US Department of Transportation, *David A. Pier*, MP Associates, Inc., USA

10:00 BREAK

Session 15

Session Chairperson: *Ma Qingguo*, Commissioner of Hunan Provincial Federation of Fireworks, China

10:30 Study on Drop Test Explosion Mechanism and Explosion-Proof Countermeasures of Shells - *Jiang Zicheng, Tan Aixi, Xiao Jiayong, Zhang Guanghui, Jiang Fangming, Li Yue*, National Key Fireworks Testing Laboratory of Hunan, Liuyang, Hunan, China

11:00 The Color Coordination and Artistic Expression of Fireworks - *Wei Chenyan and Tang Yuehua*, China

11:30 Discussion of Training of Professional Technical Personnel in Fireworks and Firecrackers Industry - *Yang Jiming*, Fireworks and Firecracker Engineering Department of Safety and Technique College of Hunan, China



12:00 CLOSE

Closing Remarks

Ettore Contestabile and Li Dingping

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China Host Committee (CHC)
Monday Welcome Dinner
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Liling Fireworks Administration Bureau
Tuesday Lunch
MagicFire Inc. and Rho Sigma Associates, Inc.
Golf shirts and Proceedings CDs
Pyro Spectaculars Inc.
ISF Bag
Yihelong Fireworks Group Co., Ltd
Wednesday Liuyang Dinner

CHINA HOST COMMITTEE (CHC) SCHEDULE OF ACTIVITIES DURING

October 14th, Monday: Welcome Dinner hosted by the China Host Committee (CHC)
Time: 18:00
Site: Banquet Hall on the third floor of Empark Hotel, Changsha

October 15th, Tuesday: Fireworks Display at Orange Island
Time: 20:00
Site: Dufu River Pavilion, Changsha
Sponsors: Sunny International Ltd. – Happiness Changsha
Liuyang New Year Fireworks Manufacturing Ltd. - Resplendent Fireworks
Liuyang Apply Art Firework Charging Co., Ltd. – Swan and the Prince
(Display performances order list as above)

October 16th, Wednesday: Liuyang Tours
The tour is conducted by two groups

13:30 Depart for Liuyang city,
15:00 Visit to Dancing Fireworks Factory,
16:00 Visit to Yihelong Fireworks Factory,
17:30 Visit to Fireworks Museum,
18:00 Visit to Litian Temple,
18:10 Visit to the Exhibition of Paper-cutting art,
18:20 Visit on the Biannual Exhibition of Fireworks;
18:30 Completion of tour and returning to Liuyang for dinner at Yintian Hotel
20:30 Return Empark Hotel

October 17th, Thursday: Fireworks Display at Orange Island
Time: 20:00
Site: Dufu River Pavilion in Changsha
Sponsors: US Dun Pai Fireworks Group – Color of Passion
Liuyang Jinsheng Fireworks Co., Ltd. – Night of Blossoming Fireworks

Hunan Dream Fireworks Co., Ltd. – The Lion King
(Display performances order list as above)

10月14日 星期一, 时间 18: 00

活动内容: 论坛中方筹备委员会宴请

地点: 长沙世纪金源大酒店一楼宴会厅

10月15日 星期二, 时间 20: 00

活动内容: 观看橘子洲音乐焰火展示

地点: 长沙市杜甫江阁

表演单位 - 表演主题 (按出场顺序):

湖南景泰烟花有限公司 - 快乐长沙

浏阳市新年烟花制造有限公司 - 璀璨烟火

浏阳市苹果艺术燃放有限公司 - 天鹅与王子

10月16日 星期三, 时间 13: 30

下午参观介绍, 分 2 组进行。

地点: 浏阳

活动内容: 参观东信烟花集团有限公司; 颐和隆烟花集团有限公司; 花炮博物馆; 李畋庙; 剪纸展; 花炮双年展; 返浏阳银天大酒店晚宴。颐和隆烟花集团有限公司招待晚宴

10月17日 星期四, 时间: 20: 00

活动内容: 观看橘子洲音乐焰火展示

地点: 长沙市杜甫江阁

表演单位 - 表演主题 (按出场顺序):

美国盾牌烟花公司 - 激情之色

浏阳金生花炮有限公司 - 爱

湖南梦想烟花有限公司 - 狮子王

10月18日 星期五, 时间: 18: 30

活动内容: 第十四届国际烟花论坛闭幕礼暨招待晚宴

地点: 长沙西湖楼酒家

中方会务联系人

孟新 联系电话 18673183841

11TH CHINA (LIUYANG) INTERNATIONAL FIREWORKS CULTURAL FESTIVAL

October 19th Saturday : 19:38 Fireworks Art Festival

Liuyang Fireworks Stadium

The Fireworks Art Festival theme on " Bright Millennium and Happy World", by the combination of fireworks art and literature art performance, present the exquisite technology of display, most skilled layout and fashionable performance, making you enjoy the charming of the dance of pyrotechnics, fairy of fire.

October 20th Sunday 19:38, The 5th International Pyromusical competition

Liuyang Fireworks Stadium

Four companies joint the event An international performance will present to you at the end of the every displays, combined with the fantastic performance by the famous singers and actors, as well as the excellent layout, it will bring to you a unbelievable feast.

October 21st Monday 19:38, The innovative Fireworks Demo Show

Liuyang Fireworks Stadium

The Innovative Fireworks Demo Show will present the safety and environmental protection products and other famous, excellent and special products from the fireworks industry. Meanwhile, as the request of the new national standards to the safety display, and by the micro-pyromusical show to promote the economic display that the consumers can afford such professional display.

CHC Contact Person

Meng Song Mobile: 18673183841



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