

**Keynote Speech ..... KEY 1**  
**Don MacLean**

*Theatre engineering and architecture, the background to Cirque du Soleil, their approach to each new show and their venues, equipment reliability, creative design of a new cabaret-style adult show in Las Vegas, the concepts for the lobbies, auditorium and equipment.*

**Show Technology ..... OSCR 1**  
**Chris Harding-Roberts, Simon Marlow, David Wright**

*Backstage operations in the Royal Opera House, the stage wagon system, its functions, the extra-height fly tower; technology and size of shows pushing British theatres to their limits, constraints of get-ins, the need for accurate plans, power for technology, basic theatre facilities required; conflicts between technical installations and heritage, onerous regulations; acceptance of equipment in view, cable management routes; London Coliseum solutions.*

**Audience Safety ..... OSCR 2**  
**John Earl, William Conner, Stuart Martin**

*Short history of theatre fires, introduction of safety curtain, need for good planning, causes of deaths, the theory behind the safety curtain, recent benefits of having safety curtains, the process of evacuation; need to protect human life, fire loads on stage, location and causes of theatre fires, benefits of sprinklers, smoke management, providing suitable protection, need for good management; different stage formats, analysis of the risks, comparison with other buildings; fundamental principles, fire engineering solutions, the New Tyne Theatre fire.*

**Beating technology noise ..... OSCR 3**  
**Olaf Ulrich, Werner Schirmer, Sam Wise, Nick Edwards**

*Development of extreme silence requirements, cost of compliance, noise measurements on stage elevators, the most significant noise parameter, graphical results; Royal Shakespeare Company at the Roundhouse, silent heating system, noise of hoists and lighting equipment; noise from luminaires and dimmers; silicon-controlled rectifiers, insulated gate bi-polar transistor and sine-wave dimmers tested, graphical results, fluorescent ballasts, intelligent lights, maintaining a quiet venue after handover.*

**Access to performing arts buildings ..... OSCR 4**  
**Emma Savage, Margaret Hickish, David Griffiths**

*Disability, grants, spending power of disabled people, legislation and standards, access to work, changing buildings to accommodate, reasonable provision, working backstage with a physical disability, stage door facilities, backstage provision, lifts, infra-red systems, refuges, phased evacuation, box office and foyers, the auditorium, wheel chair positions.*

**Operations and staffing ..... OSCR 5**  
**John Seekings, Nikolaj Jensen, Ric Green**

*Royal Opera House staffing and operations, development plan and benefits of new equipment, management approaches; Royal Theatre Copenhagen staffing and operations; future plans; the new Copenhagen Opera; Opera North staffing and operations, difficulties when touring, current technology, ideas for the future.*

**The future of live performance ..... OSCR 6**  
**Anne Minors, David Taylor, Marc John**

*The population, speed of developments, attitudes to culture, need for enhanced experience, sightlines, design of Royal Opera House auditorium, eastern advances in concert halls, the differing requirements of users, producers, performers, funders, architects; exploration of new spaces; why go to a performance, changes in concert presentation, new hi-tech buildings; Kimmel Centre; Kodak Theatre; reliability, interactive facilities; high definition digital projection; relays of live shows, distribution of arts products; the relays from the Royal Opera House.*

**Risk Management ..... OSCR 7**  
**Chris Bourgeois, Nick Cragg, John Seekings**

*Project risks, project manager's duty to warn, keeping records, design rights, protection in competition, copyright, risk of working on-line and by e-mail, reasonable level of knowledge expectation, responsibility for costs, Part-L Building Regulations; selecting a design team, fees and scope of works, sign off milestones, make minimal changes to Brief, communications, cost risk, contingencies, involve contractors, funding and cash flow; need for adequate time; all theatres are prototypes, problems of a refurbishment; change control, planning the opening.*

**Project Management ..... OSCR 8**  
**Geoff Heppell, Eric Gabriel; Ian Blackburn**

*Royal Academy of Dramatic Art, ownership of issues, contracts, contractors, clients, the unexpected, the design team, specialist contractors, over-involvement, the ABTT, time, allocation of risk, incentives, public relations, funding delivery; Glyndebourne and National Theatre, client sponsor, critical nature of early stages, maintain good teamwork, the lessons; Royal Albert Hall, need for good organisation, reporting systems, common language, dealing with disruption, collaboration, knowledge transfer, consensual working, clear objectives, collaboration, accountability.*

**Why do theatres cost so much? ..... OSCR 9**  
**Gary Faulkner, John Dare, Stewart Donnell**

*Comparisons of recent UK theatres, distribution of costs, comparison with commercial buildings, volume, foundations, holes cost money, complexity, lack of repetition, visibility, fittings, equipment costs, procurement methods, professional fees, funding, glass and Part-L Building Regulations; Sydney Opera House, performances, maintenance issues, concert hall ceiling, stage extension, the roof, strategic asset maintenance; US project costs, foyer and back of house costs, cost of meetings, benefits of building for arts and culture.*

**Energy efficiency and comfort ..... OSCR 10**  
**Doug King, Colin Hamilton, Darren Woolf**

*Response factors, audience comfort, heat generated by people compared with stage lighting, principles of ventilation, thermal mass, reduced cooling plant; sustainable design, background to early theatre comfort; early 20th century systems, top down air distribution, modern examples of sustainable systems, acoustic separation, plant noise, comfort control; computational fluid dynamics, application to London Coliseum, graphical results of experimental cases, conclusions and results.*