Turkiye

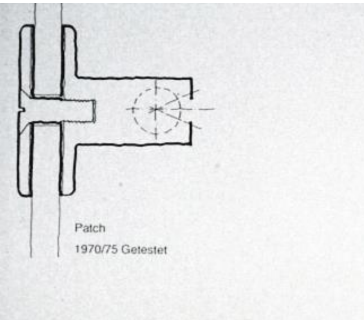
IAN RITCHIE

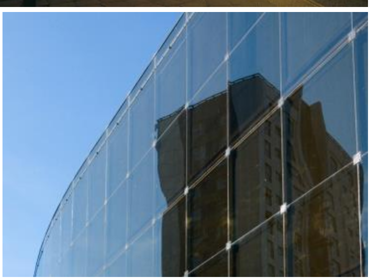
TRACING GLASS STRUCTURAL DEVELOPMENT

AND A LOOK INTO THE FUTURE OF GLASS

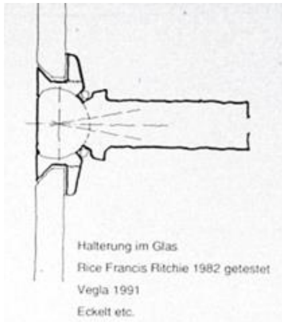
Fluy House (inc solar power) France 1976

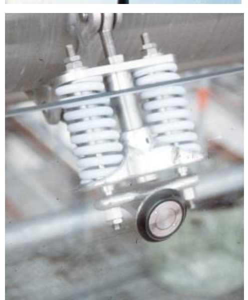
Pilkington Patch Fitting 1970



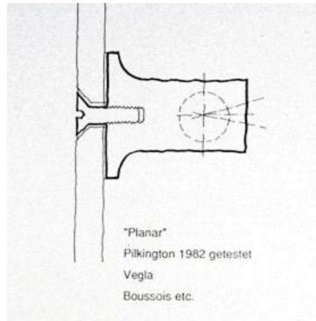


RFR 'bearing' Structural Glazing 1982-5

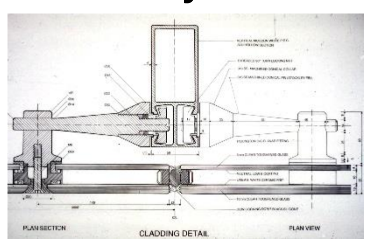




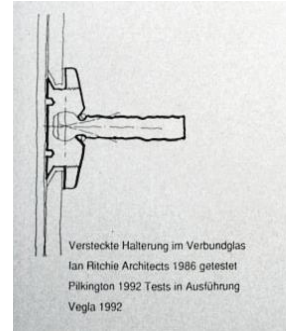
Pilkington Planar fixing c.1983



1989 DG Planar Stockley Park



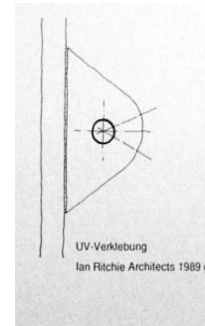
Ian Ritchie Phantom Fixing 1987



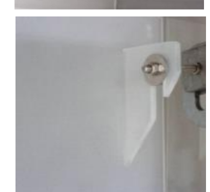
1987 Dubai Pearl

1993 Terrasson

Ian Ritchie UV Bonded Fixing 1989



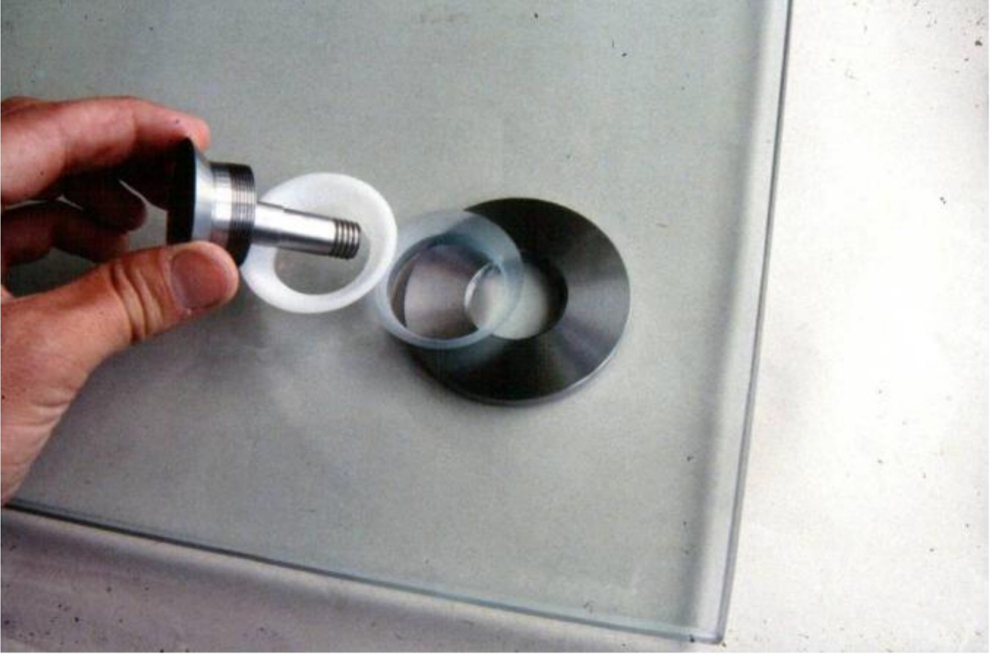
1989 Ecology Gallery

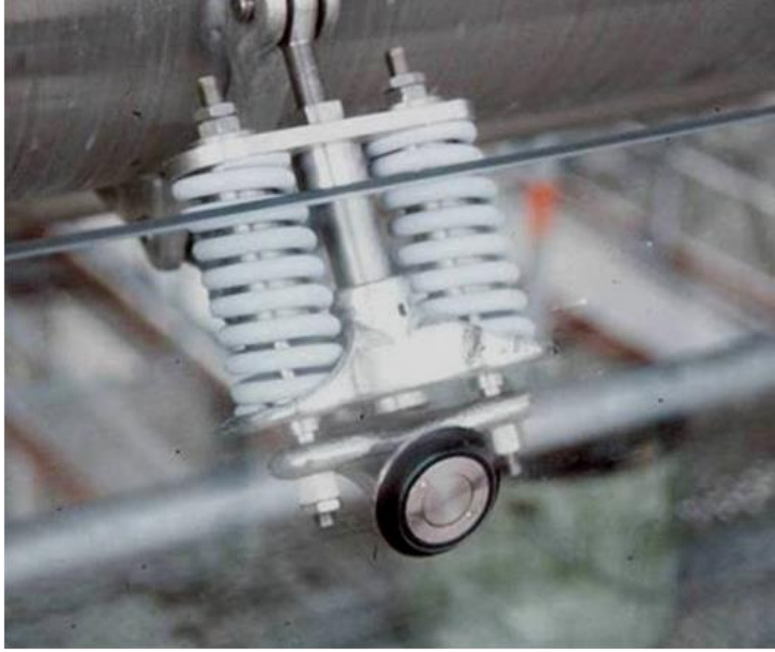


Pilkington glued bonding Research 2013-

Ian Ritchie – structural point fixed glazing evolution 1970-2010

La Villette Science City, Paris, France 1981-86

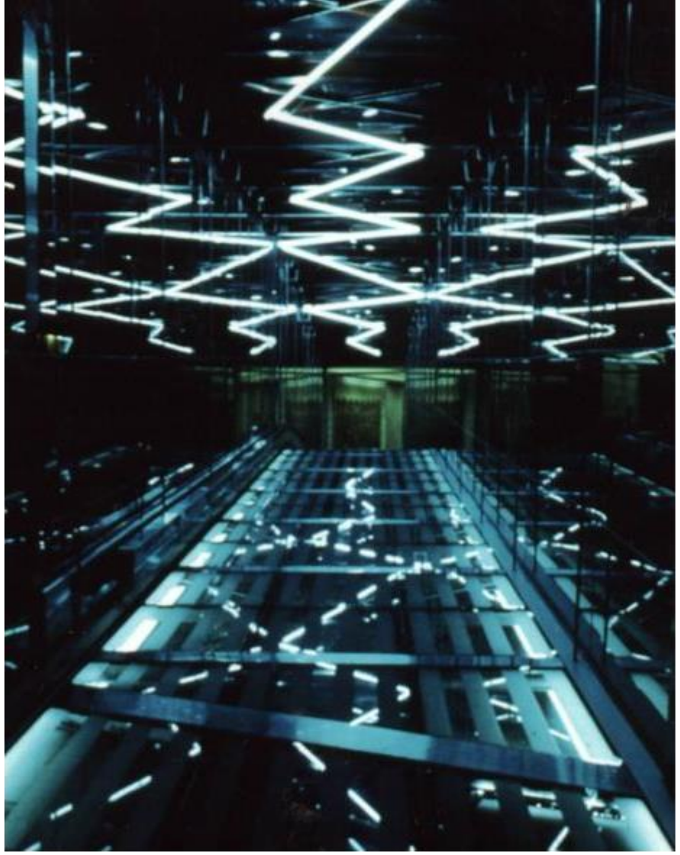




1981-85 Rice Francis Ritchie (RFR)
The French Government contract with RFR asked us to innovate.

La Villette City of Science, Paris
RFR world patent:
structural glazing that changed glass architecture

RFR 'bearing' Structural Glazing at La Villette Science City, Paris, France 1981-86



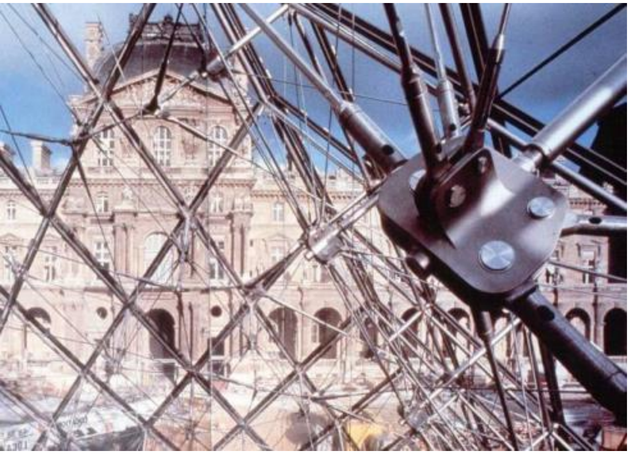
1984 Ian Ritchie Architects & RFR
Lintas Bridge, Paris

world's first all-glass bridge
incorporating a clear glass floor

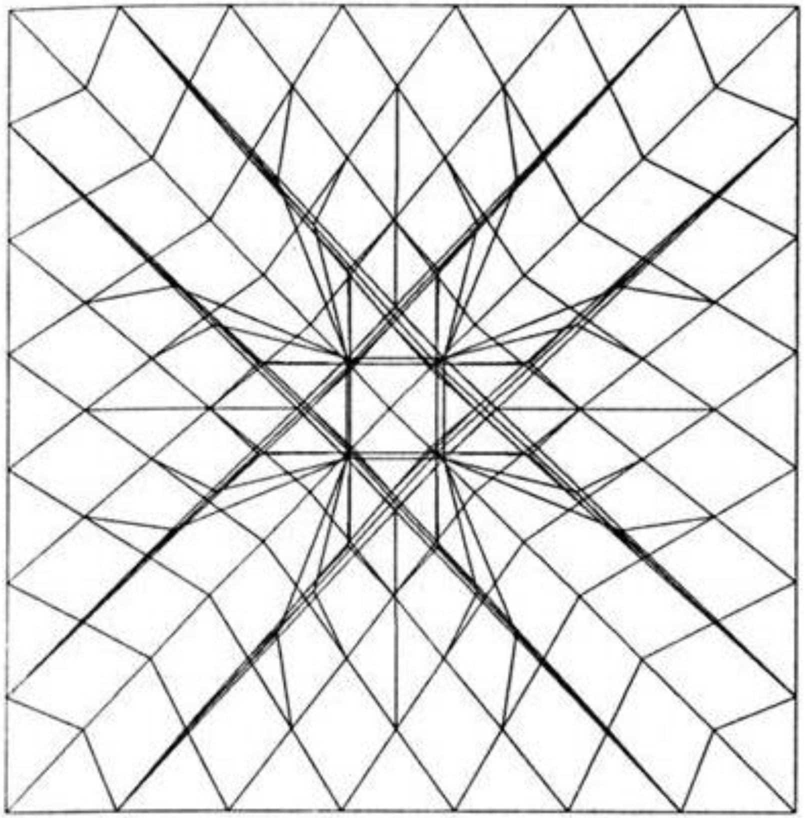
Ian Ritchie Architects + RFR All Glass Bridge, Paris, France 1984

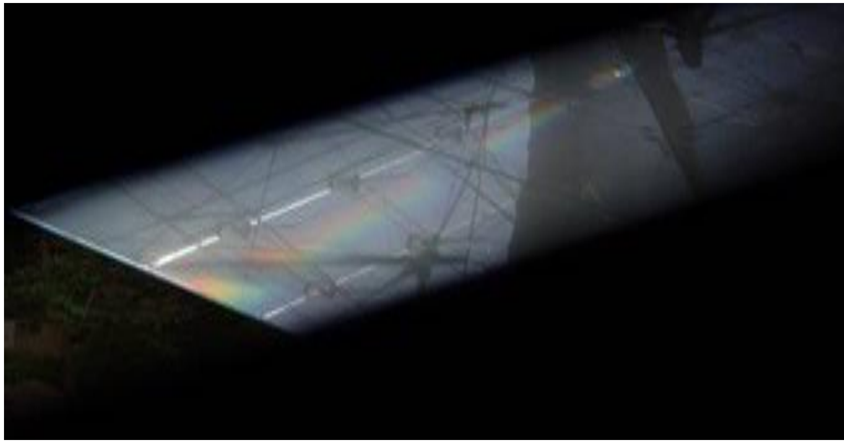
Louvre Paris (RFR) 1984-93

Louvre Pyramid full Mock-Up 1984

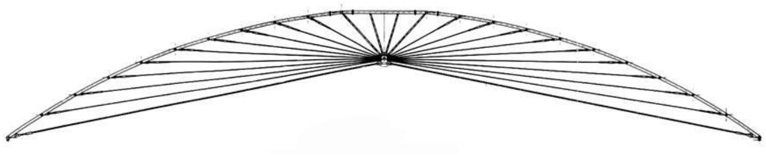


I M Pei with Rice Francis Ritchie Louvre Pyramids Paris (RFR) 1984-93

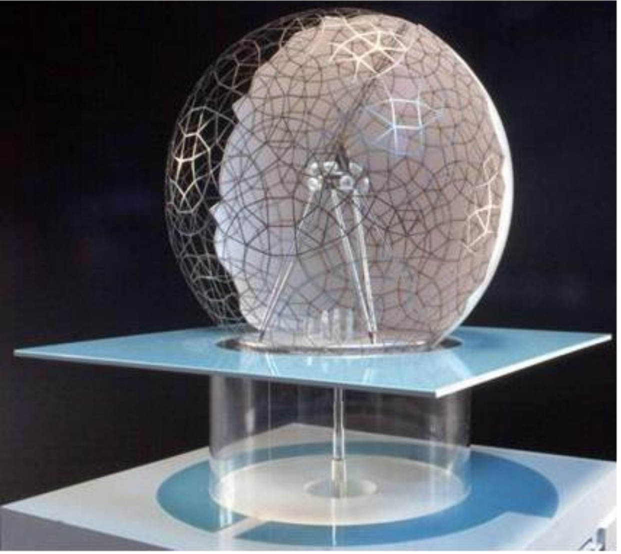




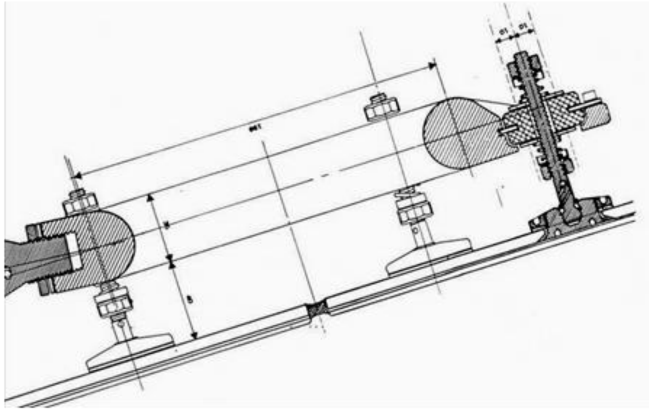
I M Pei with Rice Francis Ritchie Louvre Pyramids Paris (RFR) 1984-93



I M Pei with Arup, Ian Ritchie Architects + RFR Louvre Sculpture Courts 1984-90



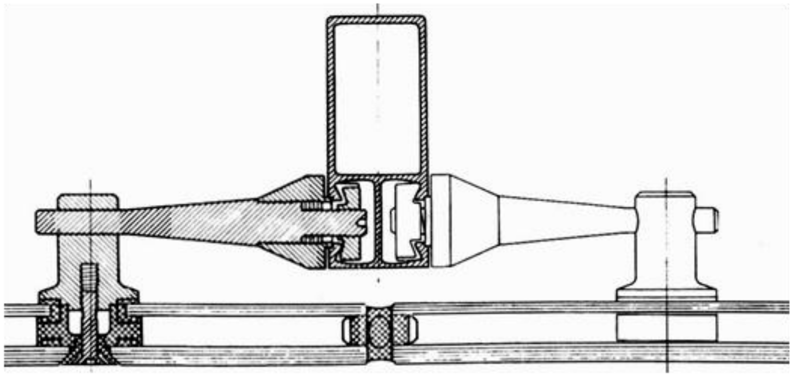
1987 Ian Ritchie Architects
Dubai Pearl Monument
laureate (unbuilt)

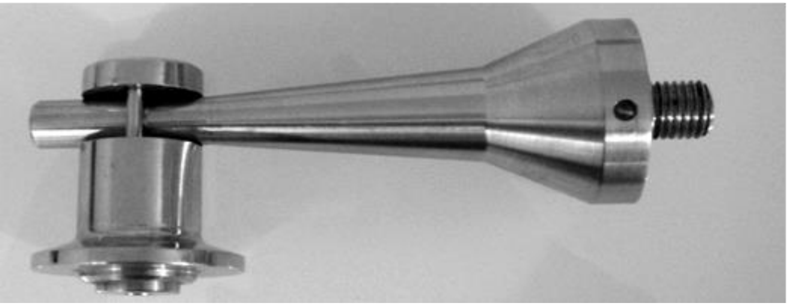


'The Phantom Fixing'
published in the AJ 1987

world's first structural glass fixing through one leaf only of a doubly curved two-layer toughened laminated glass panel

Dubai Monument Ian Ritchie Architects 1987

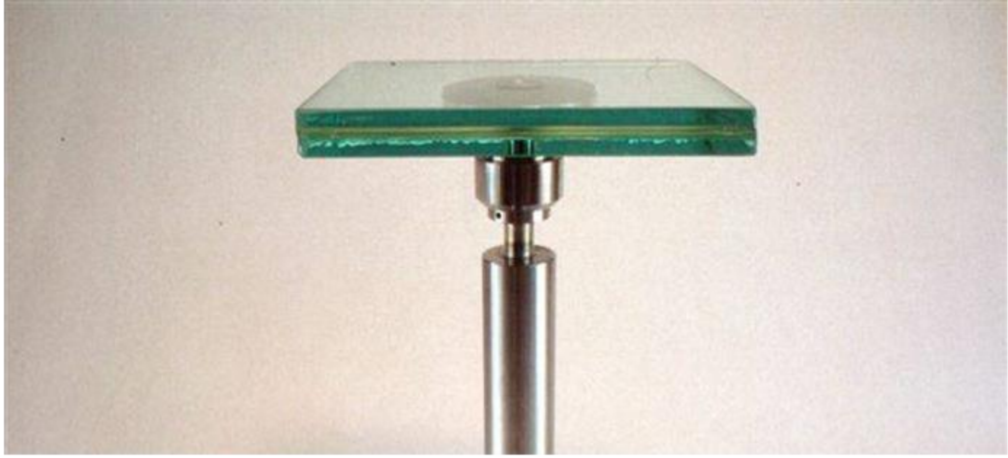




1989 Ian Ritchie Architects
Stockley Park, R&D Offices, London

Double glazed Planar™ developed with Pilkington, with the 'Stockley Pin'.

Stockley Park Research Offices Ian Ritchie Architects + Pilkington 1989



1992 Ian Ritchie Architects
Terrasson, France – laureate

'The Phantom Fixing' developed for the Pearl of Dubai applied to fix the glass roof 'lake' on the Terrasson Cultural Greenhouse

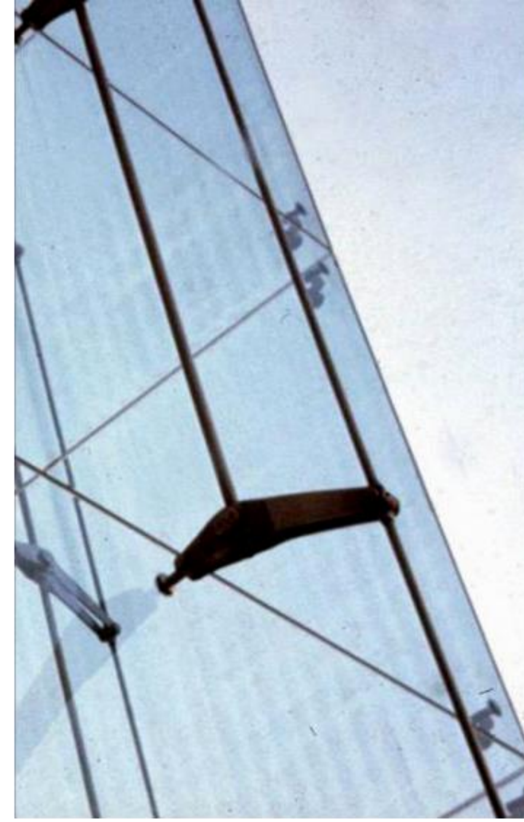
Terrasson Cultural Greenhouse France, Ian Ritchie Architects + Kathryn Gustafson 1992

1989 Ian Ritchie Architects
Natural History Museum
Ecology Gallery, London

first application of structurally glued
glass to glass fixing in a public building

first use of 6mm thick low-iron glass
in architecture – from Pilkington

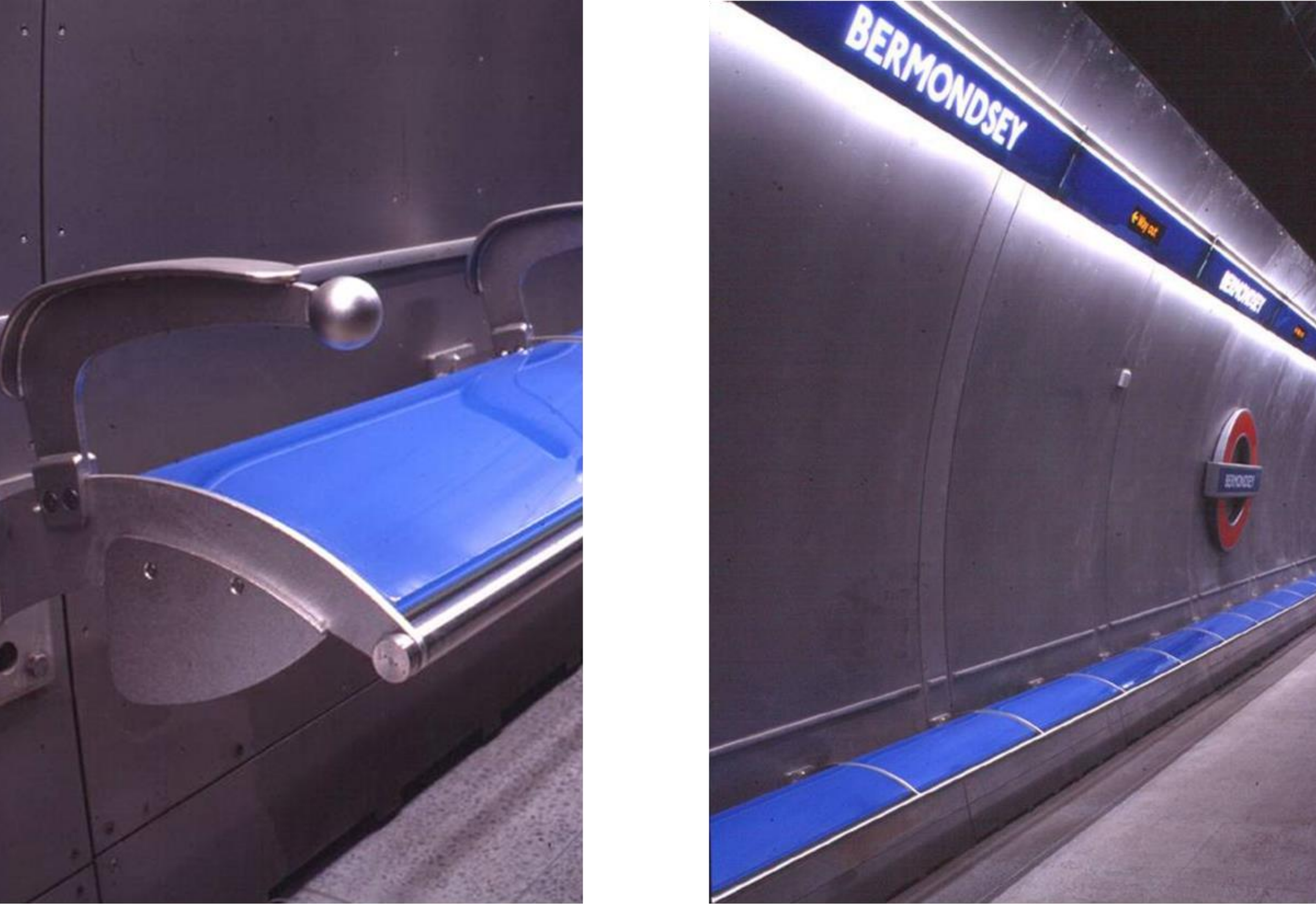
Ecology Gallery Natural History Museum Ian Ritchie Architects + TW Ide + Pilkington 1989



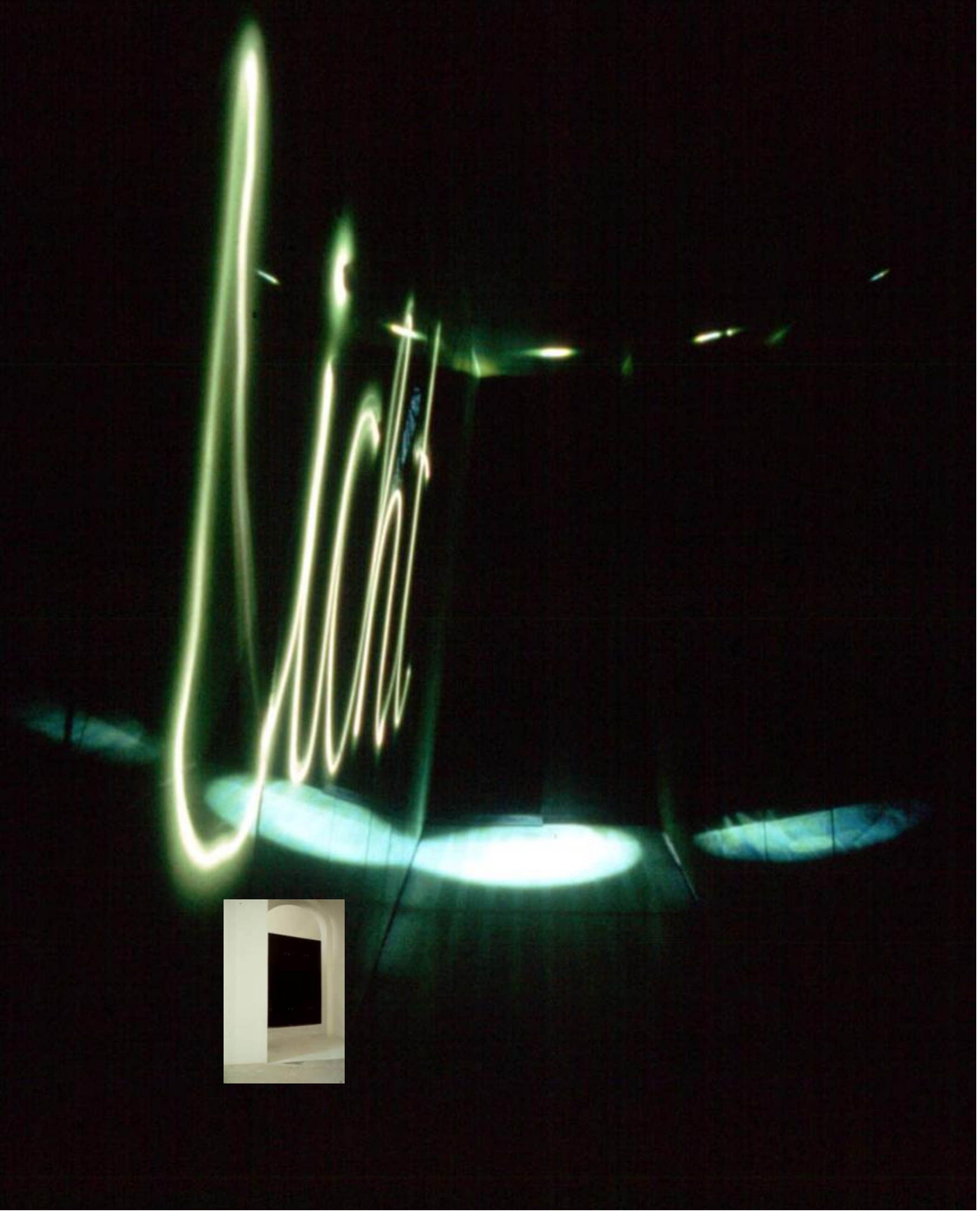
1991 Ian Ritchie Architects + Arup + Pilkington
Reina Sofia Museum of Modern Art, Madrid

world's first glass installation which transfers wind load at the corner of the building through the glass edges

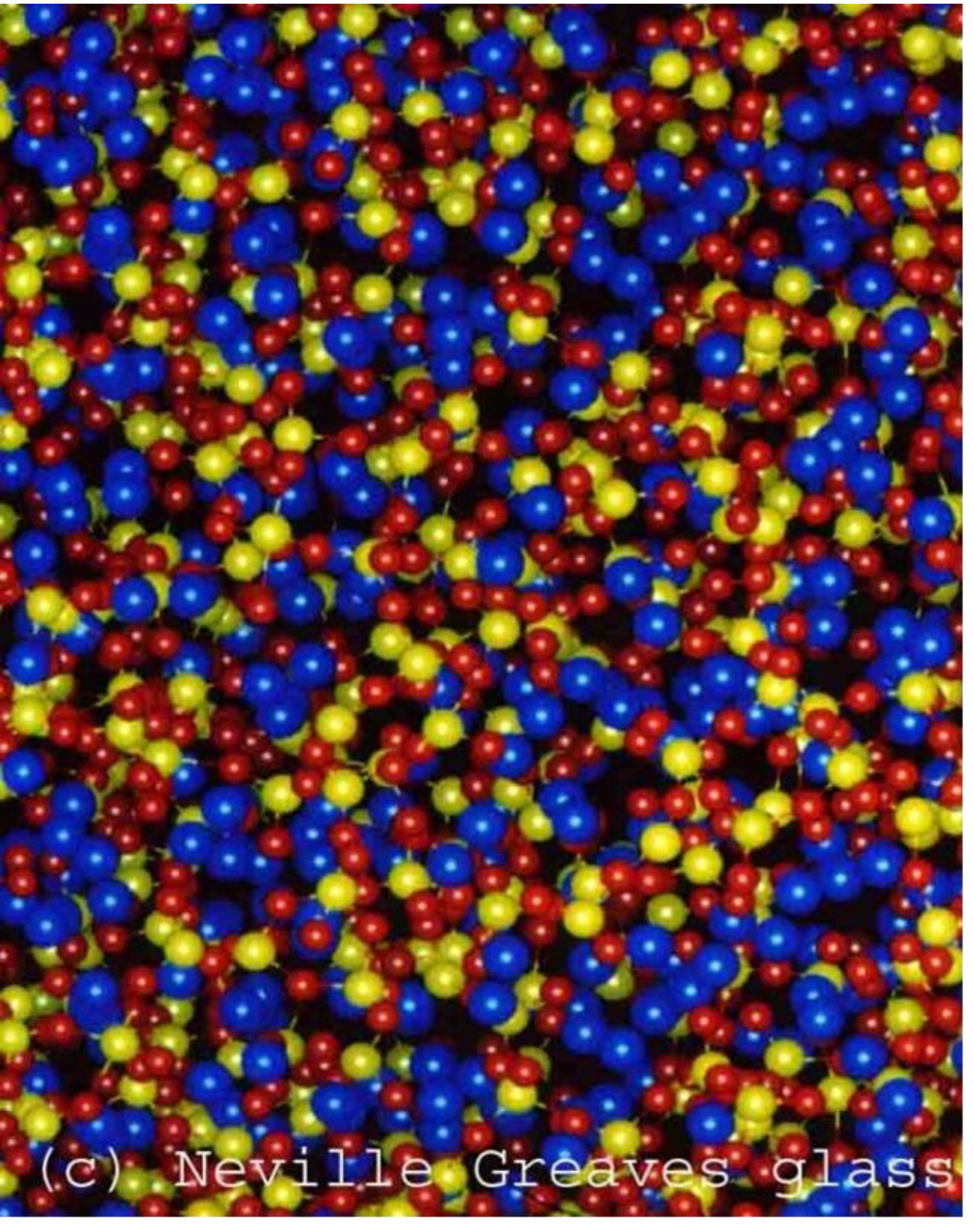
Reina Sofia Museum of Modern Art, Madrid, Ian Ritchie Architects + Pilkington 1991



Bermondsey Underground Station, London. CT Glass curved laminated seats, 1991-99

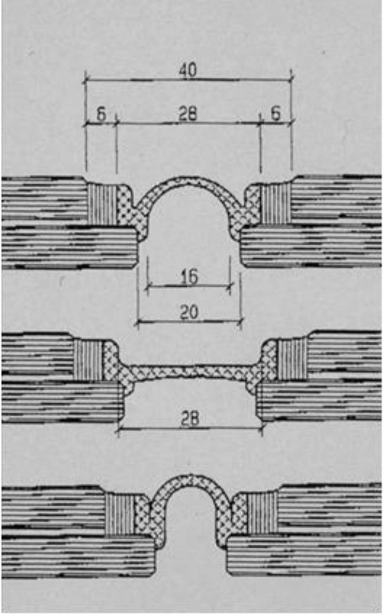


Light Memory Coating on Glass, Ingolstadt, Germany, Ian Ritchie Architects + Pilkington, 1992



Research: molecular doping of Na glass to limit crack propagation:

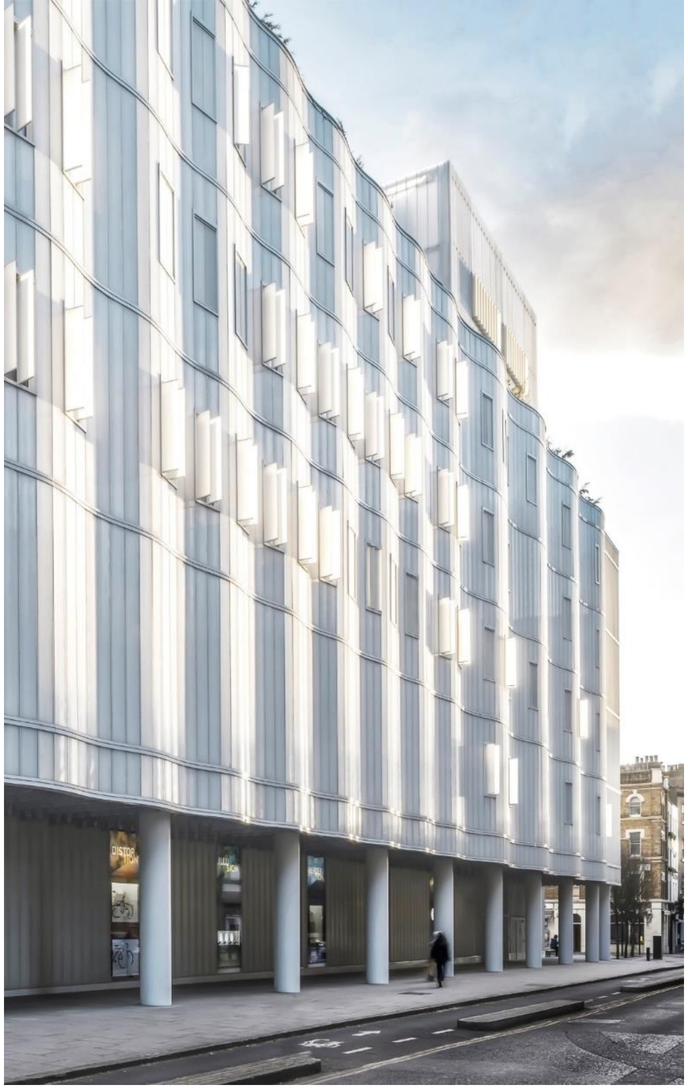
Glass breakage research Neville Greaves (physicist) + Ian Ritchie, 1993-99

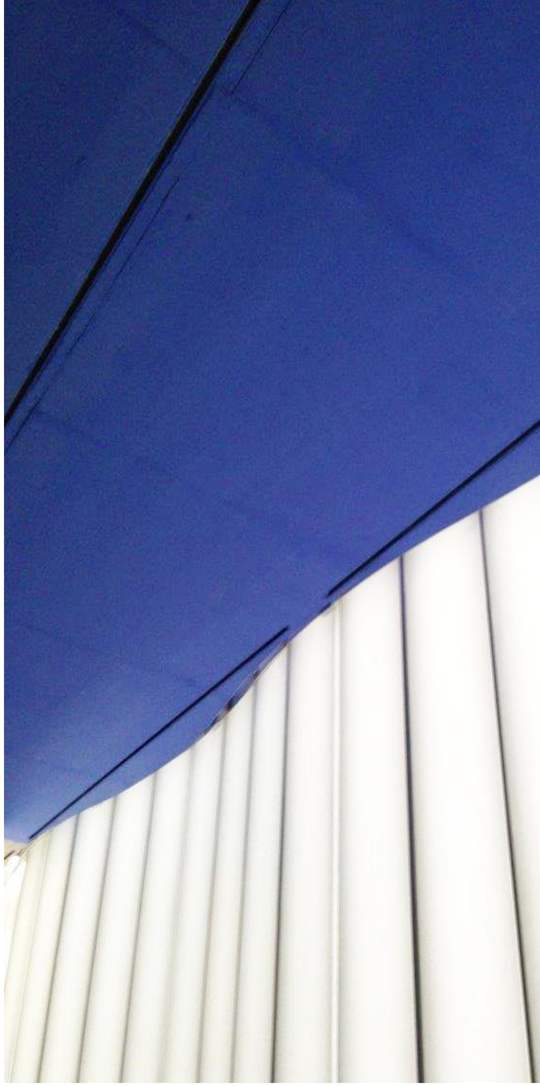


1994 Leipzig Glass Hall, Germany Ian Ritchie Architects + gmp + IPP + mero + seele

The world's largest glass hall covering 2.5 hectares using low-iron laminated glass
The first single side application of extruded silicone/liquid silicone glass to glass joints
Externally cleaned by robots

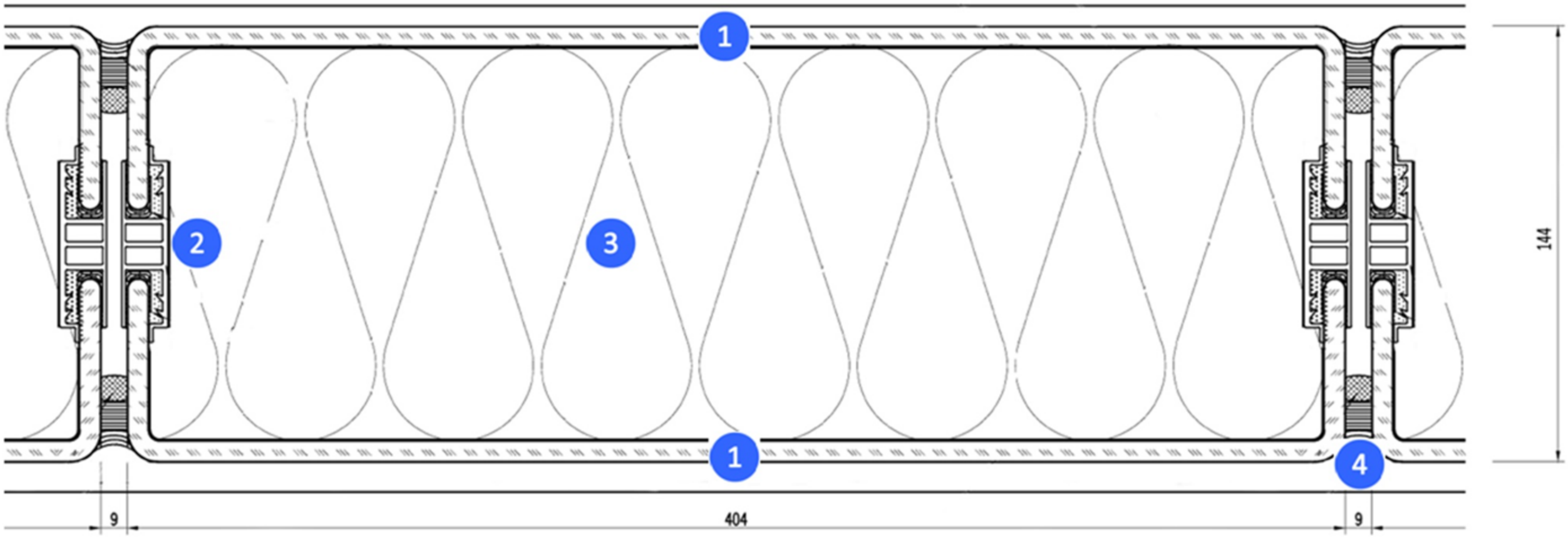
Leipzig Glass Hall, Germany, Ian Ritchie Architects + gmp 1993-99





modularised, insulated, low-iron, toughened structural cast glass (Lamberts), contractor Frener & Reifer

Sainsbury Wellcome Centre @ UCL London, Ian Ritchie Architects 2015

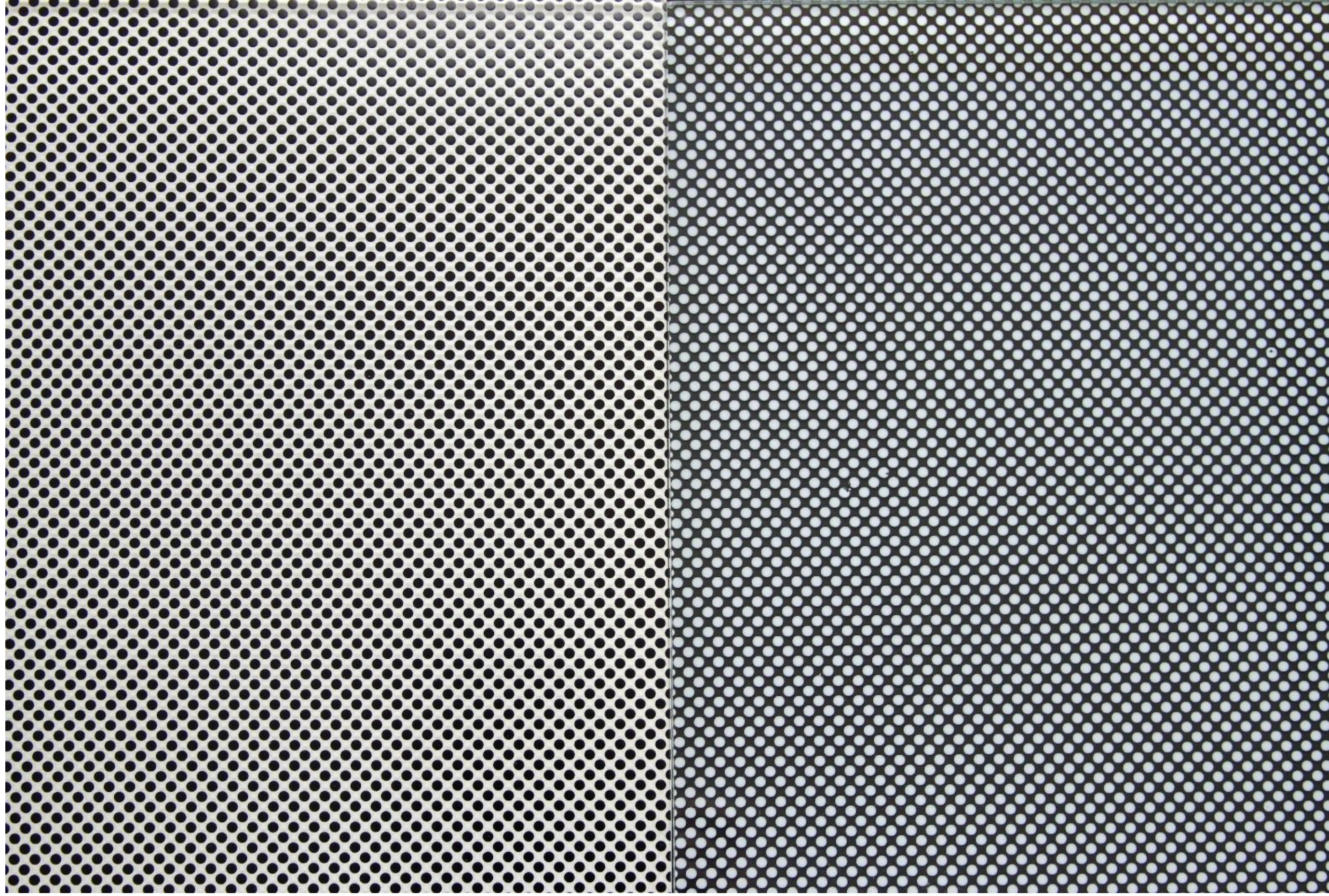


Plan of cast glass assembly

1. Lamberts Linit 404mm wide 8mm thick low-iron toughened heat-soak cast glass with enamelled fit to inside face. 'Cord' profile to outside face, and selected to reduce maintenance - cleaning requirements; 'Solar' profile to inside face to permit scientists to use any part of the cast glass façade as a whiteboard (invisible to outside).
2. Polyamide thermal extrusion. Cast glass flange is bonded into place with Dow Corning 933 white structural silicone.
3. Wacotech TIMax GL translucent glass fibre insulation.
4. Nominal 9mm (variable geometry) weather silicone joints between cast glass assemblies.

Sainsbury Wellcome Centre @ UCL London, Ian Ritchie Architects 2015

Why are toughened (tempered) glass tables still marketed?

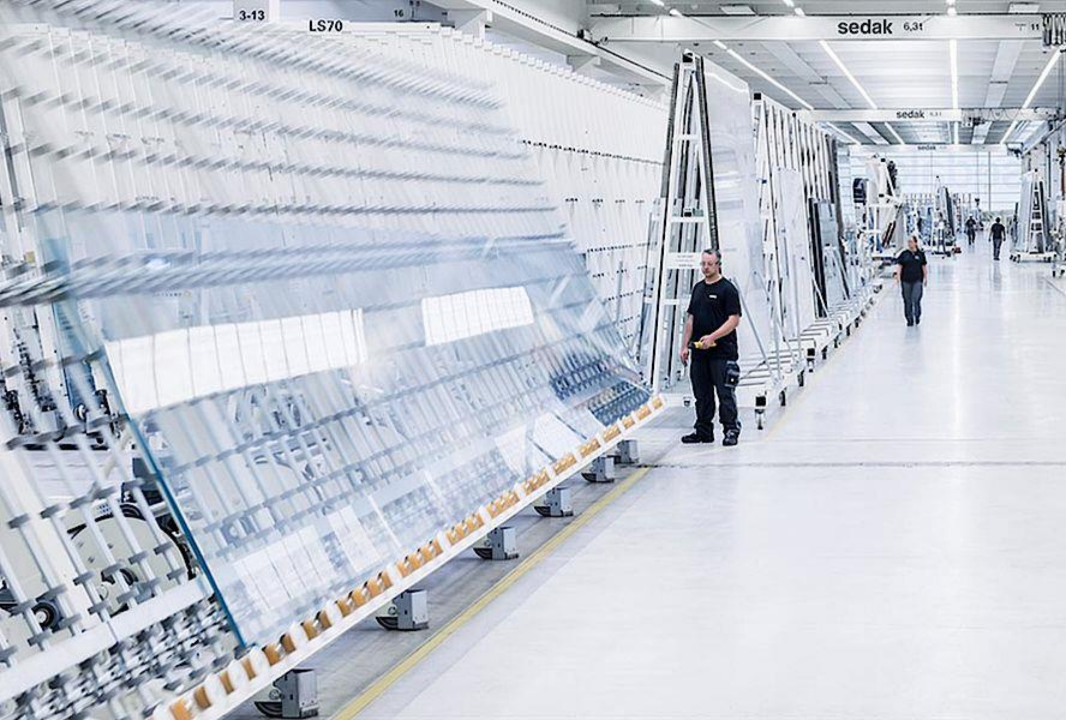


Why do designers not understand human perception and binocular vision ?

reversing a venetian blind

Why do designers not understand solar geometry and consider their neighbours ?

Glass Futures



3.51m x 20m from 2018

Scale of glass

Glass Futures

Since 1981 Ian Ritchie and his practices Ian Ritchie Architects Ltd and Rice Francis Ritchie have collaborated with many industries worldwide and confidentially on R&D projects

and those associated with glass and glass structures:

Primary manufacturers

Boussois / PPG now owned by Mexico-based Vitro.
Pilkington
St Gobain
Lamberts
Schott
British Steel
High Duty Alloys (absorbed by Alcan) now Rio Tinto Alcan
EdF
Brochier Aerospatiale
Solvay

Processors, Finishers and Installers

Seele
Mero
Bischoff Glastechnik AG
CT Glass
Frener & Reifer
Mero-Schmidlin
Novum

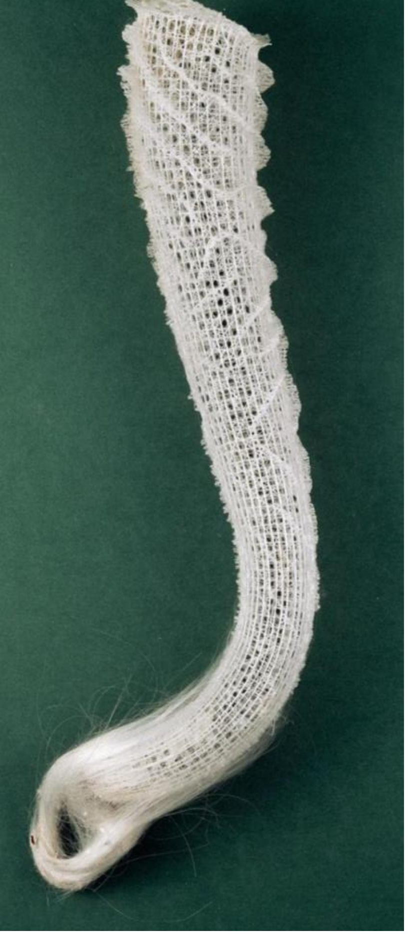
Aesthetics : Transparency, Translucency, Colour, Media-information

Environmental: Thermal insulation, Energy, Recycling

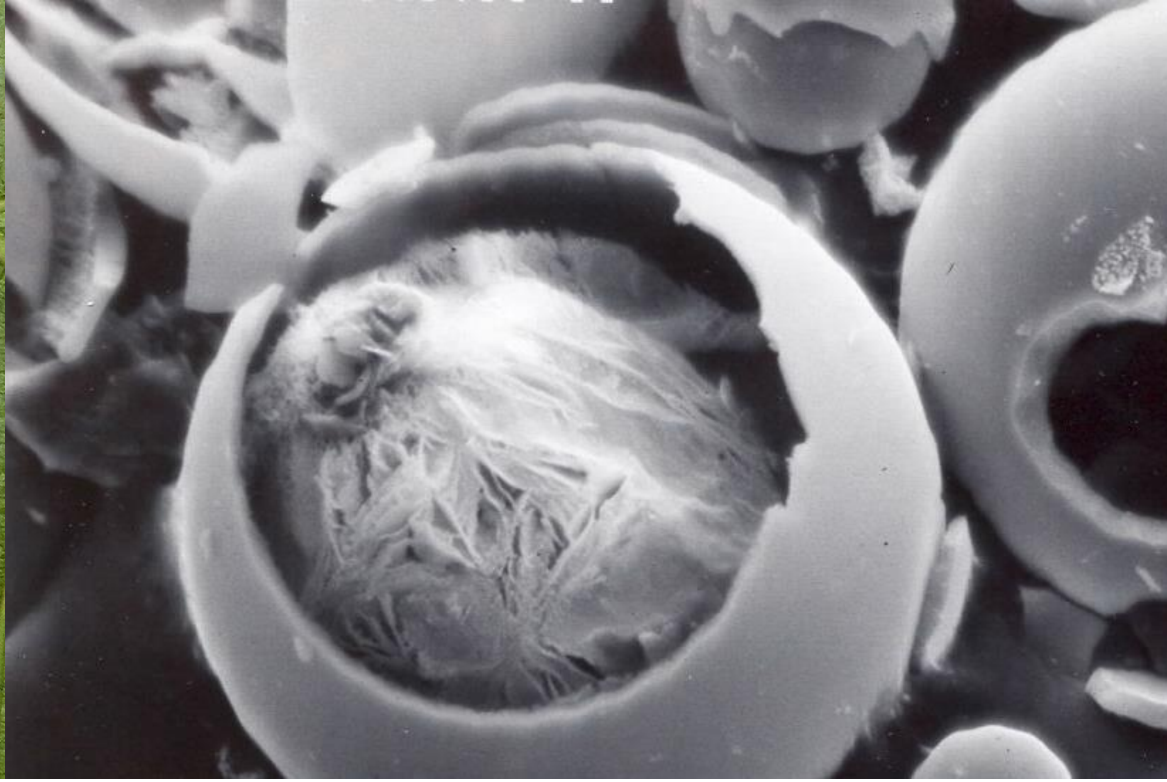
Technical: Nanotech coatings, 3D manufacture, Scale and Economy the future is biological

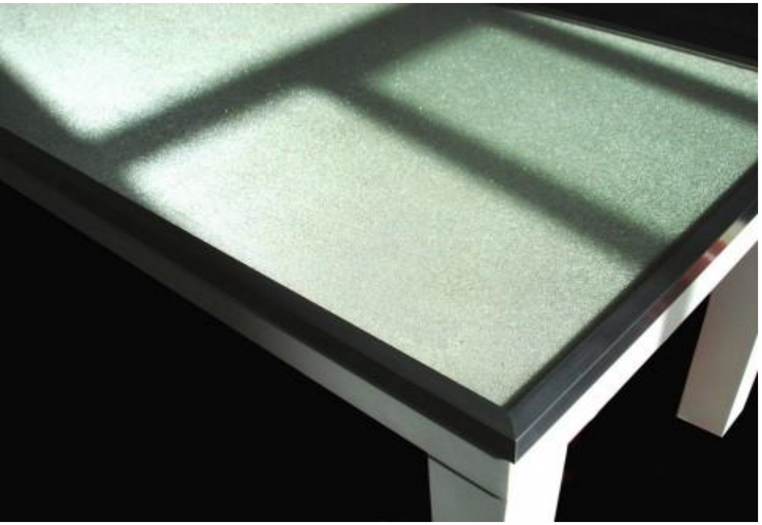
we will live in an all - electric
photon-powered future

Sea – sea butterfly (arctic snail) - zooplankton

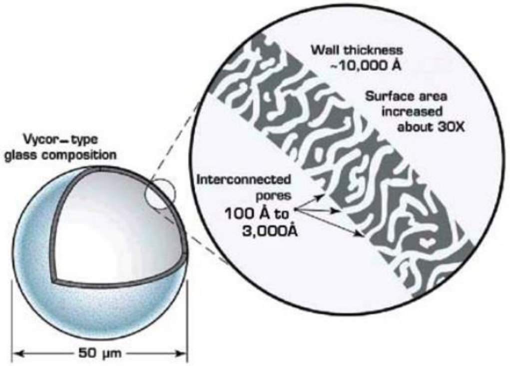


Kingdom:	Animalia
Phylum:	Porifera
Class:	Hexactenellida
Order:	Hexasterophora
Family:	Euplectellidae
Genus:	Euplectella
Species:	E. aspergillum





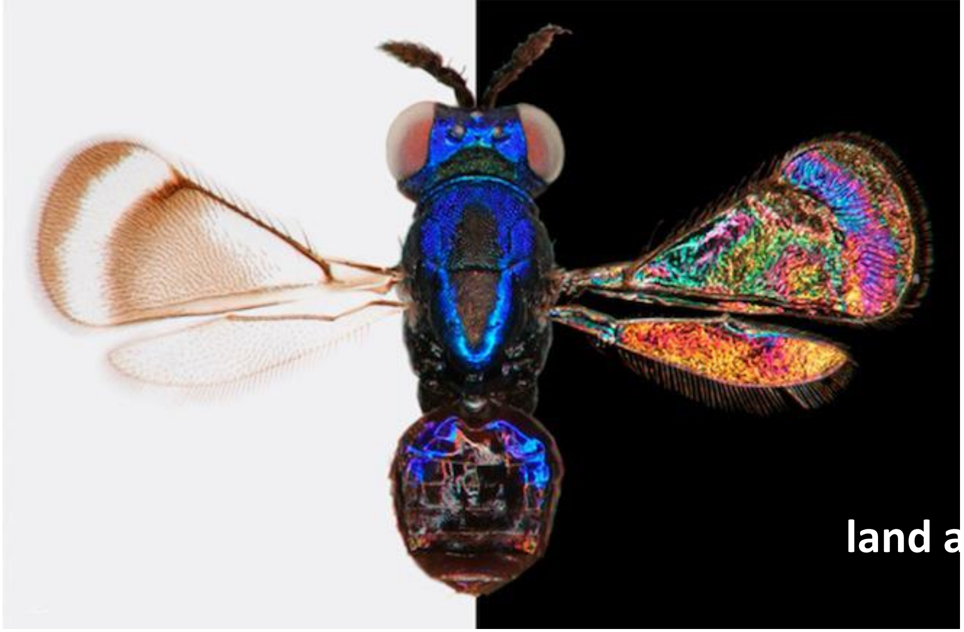
Porous glass microspheres carrying medicines, hydrogen, etc. and can prevent glass breakage – because length less than 1 micrometer (0.001 mm)



microencapsulation – thermal, safety, info

learning from Greta

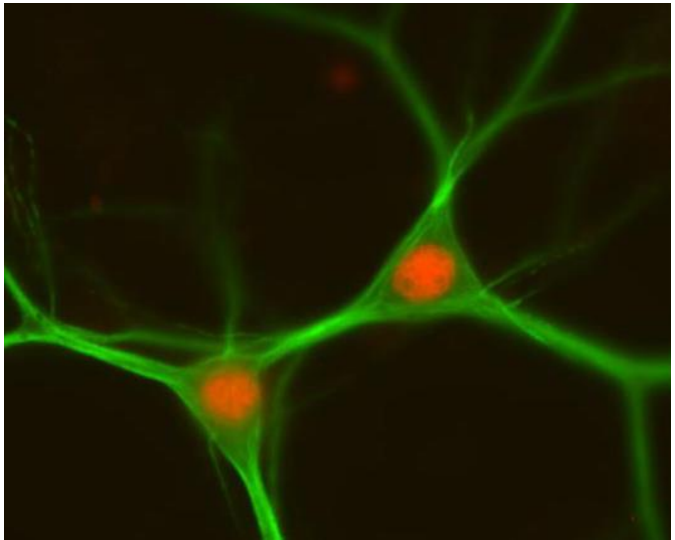
Glass Futures

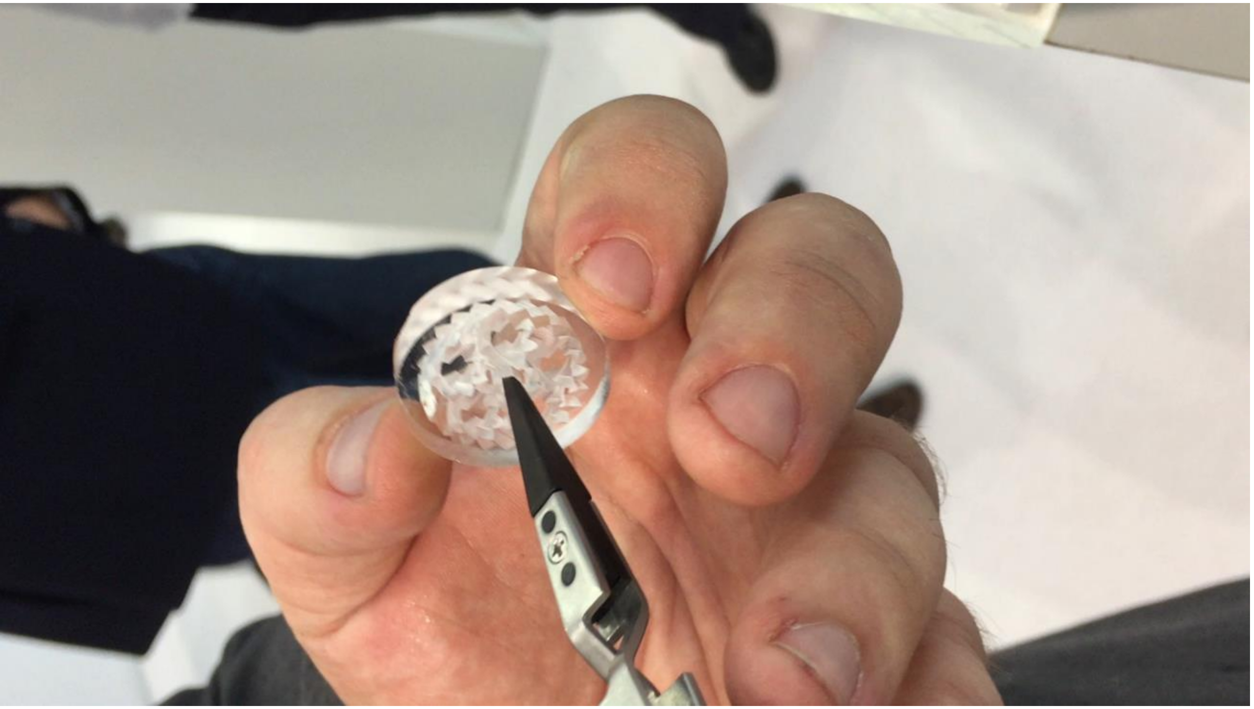


land and air

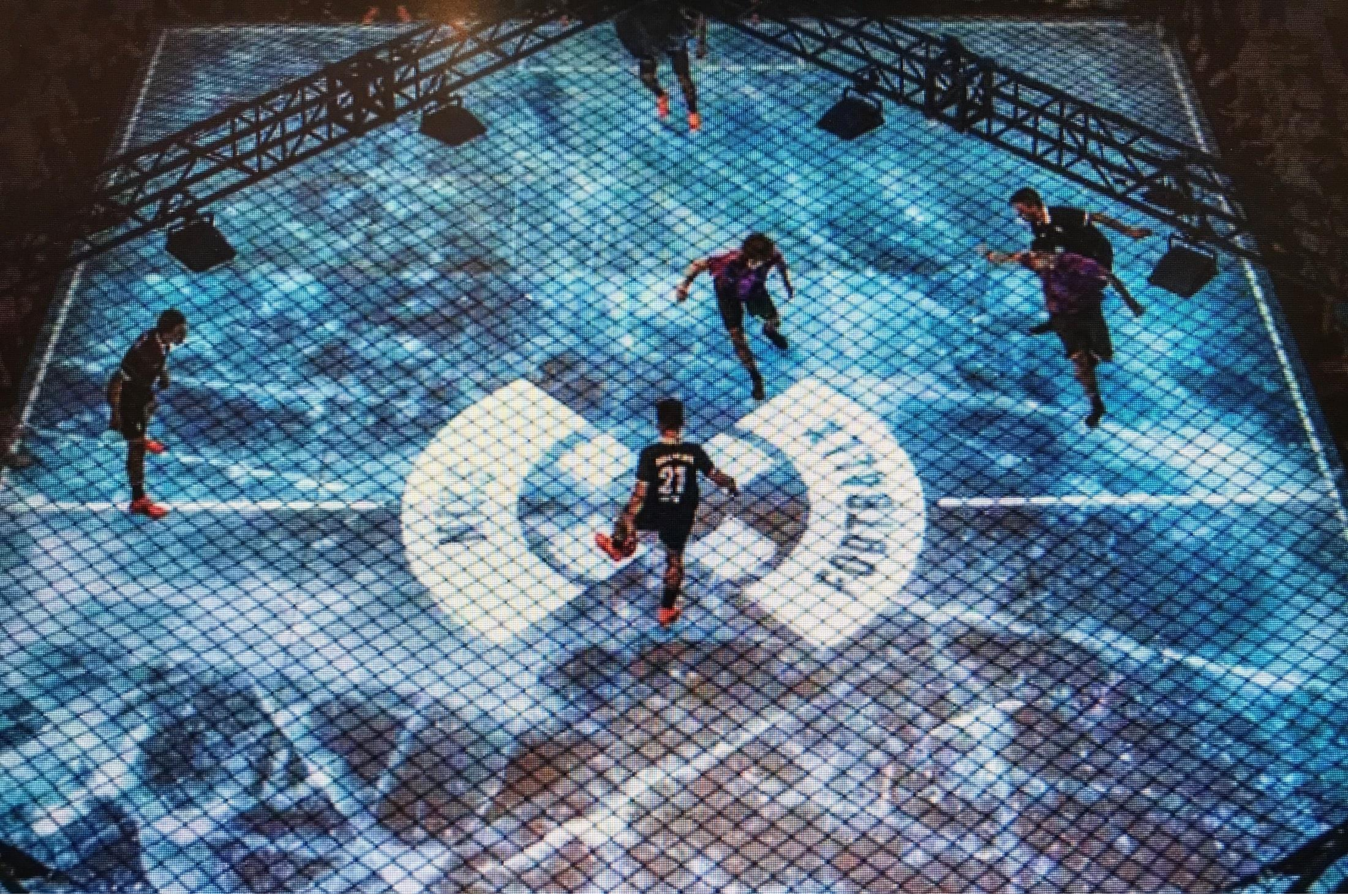
human perception

communications





Microscopic negative 3D printing – moving components. Lightfab.



The ASB LumiFlex acts as a plug-and-play flooring screen


AURORA
is this the past or the future of glass and architecture?


is the future for glass and architecture warped?

a final thought for the future

people's behaviour makes the biggest difference to sustainability

the new challenge is to deliver environments and buildings that exhibit intelligence:

by really meeting human needs, measured by how the people's brains and bodies actually respond.

our cities and architecture may then be defined as a positive neuro-design learning loop.

Future research

we should make glass warm and haptically friendly