



In 2010 Konstantin Novoselov and Andre Geim, two Russian-born scientists working in Manchester, won the Nobel Prize in Physics for their work on graphene, a carbon lattice with the promise of fantastic industrial and commercial applications (see page 28). The University of Manchester's National Graphene Institute, designed by Jestico + Whiles, will open in 2015 with state-of-the-art research facilities and office space for commercial partners. J+W director Tony Ling tells *Herbert Wright* about it

### **What relevant experience did you bring to the National Graphene Institute?**

We designed Southampton University's Mounbatten Building (winner of a 2009 RIBA Award), which has a very large clean room laboratory. A similar job at the University of Sydney is under construction. The National Graphene Institute would be by far the biggest job.

### **How is the five-storey, 7600 sq m National Graphene Institute organised?**

It is divided into two basic independent structures, the working part — labs, offices — and central utility building with mechanical and electrical services, generators and so on. There's a big separation joint. A smaller (450 sq m) clean room on the first floor is designed for industry. The basement level one (1100 sq m), with the most vibration-sensitive parts, is designed for the university's own use — we have bedrock not very far down. It has a raised floor for air extraction, and a walk-on plenum (ground floor). It's 3m high, basically a ceiling void full of ducts and pipes. A viewing corridor goes all around the basement clean room, and we've devised a viewing window so that people outside could look in,

to ensure that the whole space is visible to the public. The offices, relaxation space, break-out areas are all naturally ventilated. On the third floor is a seminar room, terrace, roof garden and a skylight window which overlooks the double-height breakout space below.

### **What sort of input did Professor Novoselov bring?**

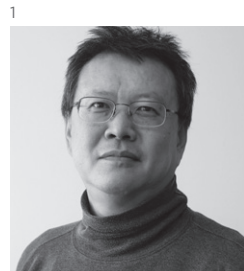
He's been involved in every single detail — the design of the labs, the furniture, the lighting, everything. He's going to be running the centre. He wanted flexibility. In 10 years' time, it could all be doing quite different research.

He wanted to have as much area in the building that he could write on, but the ironic thing is that the

University of Manchester has banned blackboards, for health and safety reasons, because of the chalk. The solution quite often is whiteboards, but after a while you can never get it completely clean. Also, Novoselov wanted something that looked like a blackboard, because that's what he is used to. You have to be able to wipe off old ideas immediately — that's the way they work. We gave him a sample of this PVC sheet called Whiterock that he tried for about six months and he's quite happy. We decided to clad the corridors around a bunch of labs in this material, and we'll provide places for the pens to be stored. Any scientist walking there can pick up a pen, or have a discussion with their colleagues. It's not just a corridor, it's a working space.

### **That aesthetic extends to the exterior, doesn't it?**

Yes, the exterior cladding is black, stainless steel, treated with acid and very reflective, like a mirror. We're still working on the perforation patterns for it. The original idea was to digitise blackboard formulas, but the illegibility of texts was an issue. Another idea was using images of graphene material on a nano scale. The latest is we've gone back to the formulas, but machine version, in different sizes.



1 - Tony Ling  
2 - North view of the National Graphene Institute, due to open next year

