The aim of this project is to create a system that hybridizes two natural systems, clouds and crystals, and simultaneously explores the aspect of light. These rich domains with the introduction of small glass beads lead to an intricate fabric of architecture and moreover to a high-resolution fabric of light.

The design process starts with intricate formation of clouds evolving in global scale, due to physics of air dynamics, in order to distribute data in space. The system is then articulated by crystal growth, which is resembled by small glass beads, in local scale to control light filtration, stability and textures. More specifically, physics of wind forces, structural growth of crystals, mathematics of voxel, goal oriented agent behaviors, physics of light as well as robotic fabrication techniques are the fundamental aspects for the composition of Crystal Cloud.
Our research cluster’s main focus was around syntactic constructability and the convergence of matter and information. Through material experimentation in the physical world, certain behaviors are translated into digital environments where they are explored through the synthetic capacities of simulation. The structure of matter should be designed in a way that results in high-resolution fabric of architecture. These fabrics are explored with millions of particles, thousands of agents, which undergo certain physics in order to organize into greater spatial configurations. Besides the large amount of data articulation in space, the aspects of robotic fabrication should be taken into consideration, which could produce a holistic innovative approach towards architecture.

This project has had hints of sci-fi leading its way, and the context it evolved in could relate to futuristic re-inhabitation of dead underground spaces that can one day become the new habitat for people living in cities, creating a sense of solitude and a escape from the noise that surrounds them. The latter broadens the horizons of the research-based approach from extraordinary design synthesis to robotic manufacturing processes and develops a dialogue among them. Consequently, we started looking into scenarios where we embed our system into abandoned underground spaces that can be redefined if more light is directed into them such as old mines or tube stations.

Eventually the pilot design proposal concerned an underground exhibition space that captures, reflects and refracts light and acts as the new entrance of the V&A museum. The intent was to create a maze, a sequence of spaces of similar formations but yet different, in terms of porosities and light qualities. The goal is to create for visitors the experience of walking inside a cloud, see the exhibits and at the same time experience extreme light differentiations through different formations.
Although the space is designed as a maze in order to make people feel as if they are lost, it still embeds in itself directionality that guides people towards the museum's main exhibition space through a sequence of light and shape.

In order to validate our proposal and to test whether a Crystal Cloud could ever be fabricated, the whole process was applied in an object of a smaller size with only 70,000 glass spheres to create a shape 180cm in width by 150cm in length and 100cm in height. The sculpture was constructed layer-by-layer, with an ABB robot and with the use of the HAL plugin, and then assembled for the B-Pro exhibition show 2013.

CRystalCLOUD DESIGN team consists of 3 members and was formed in October 2012 in London.

SHAHAAD THAMER AL-HADEETHI is from Iraq and studied architecture at Jordan University of Science and Technology.

JOANNA THEODOSIOU is from Cyprus and studied architecture at University of Cyprus.

AMIRREZA MIRMOTAHARI from Iran, who also studied architecture at University of Tehran.

We all came to London in September 2012 to start a new Master program (Graduate architectural design) at The Bartlett School of Architecture (UCL) and formed our team from the beginning of the course. The 3 of us come from very different backgrounds and had very different mentalities and perspectives towards architecture hence that was a key thing in our group formation each one of us introduced one of the key aspects of our system (clouds’ formations, crystals, and modular formation) Therefore in this project we all shared the same interests and have had a very constructive and productive collaboration. We developed our projects through the course of one year with the supervision of our tutors, Alisa Andrasek, Daghan Cam and Maj Plementias. Our main objective has been to define a new system that can transform the common understanding of space and to create a new language that communicate with the user through light.

IMAGES CREDITS
All images have been created/photographed by design team members.

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