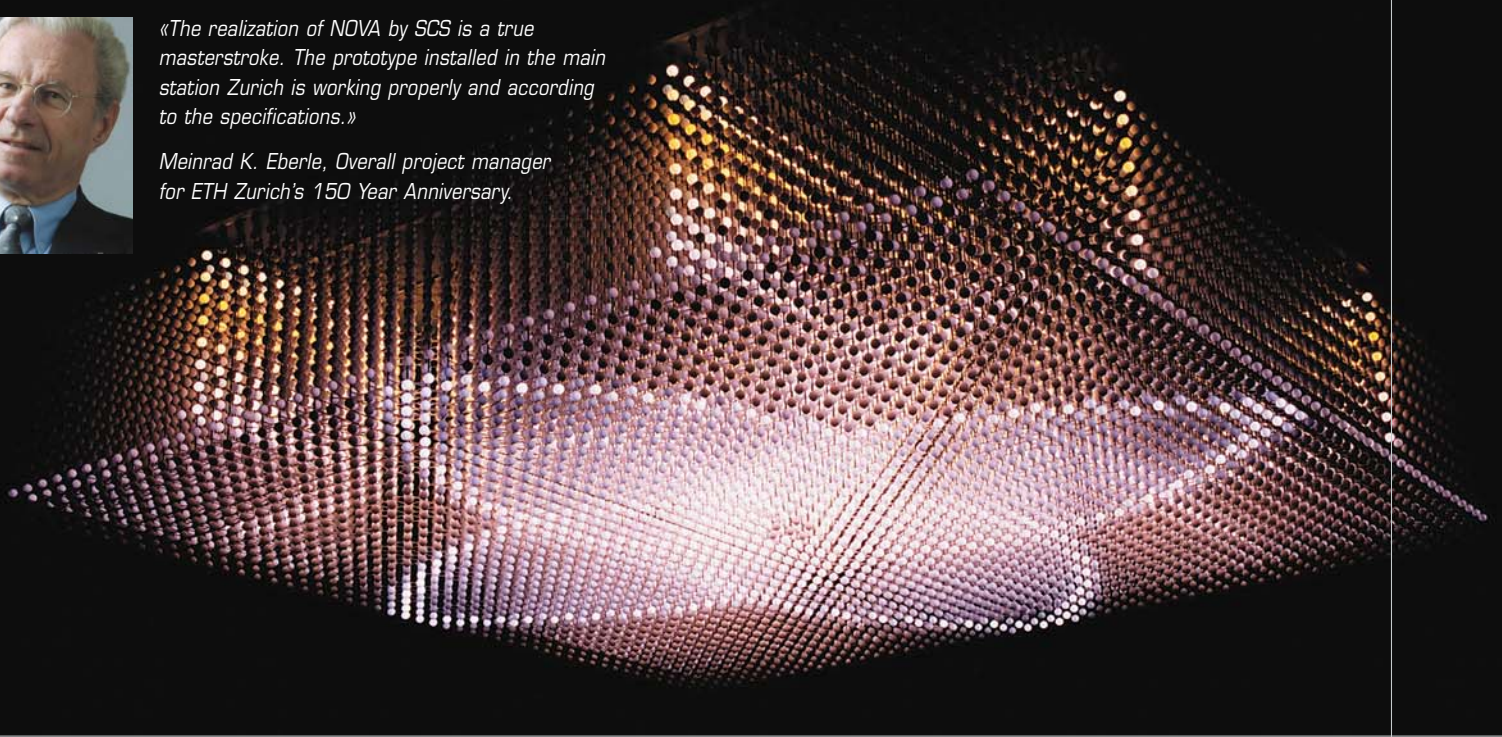




«The realization of NOVA by SCS is a true masterstroke. The prototype installed in the main station Zurich is working properly and according to the specifications.»

Meinrad K. Eberle, Overall project manager for ETH Zurich's 150 Year Anniversary.



3D-Screen «NOVA» for ETH Zurich

**3-Dimensional LED-Display
with 300'000 LEDs
and a volume of 25m³**



super computing systems

The Need

As part of the celebration of ETH Zurich's 150 year anniversary, a 3-dimensional light field was built, that hangs like a cloud in the main Zurich train station and brings the research work of ETH closer to the public.

The Challenge

ETH was looking for a partner who could turn the idea of a 3-dimensional cloud into reality in a short period of time. This required a new technical undertaking: There was no such device in the world.

The Solution

SCS was responsible for the overall system design, the development of the hardware and firmware, as well as the technical project management. Several different components had to be balanced: mechanics, electrics, electronics, software, and optics.

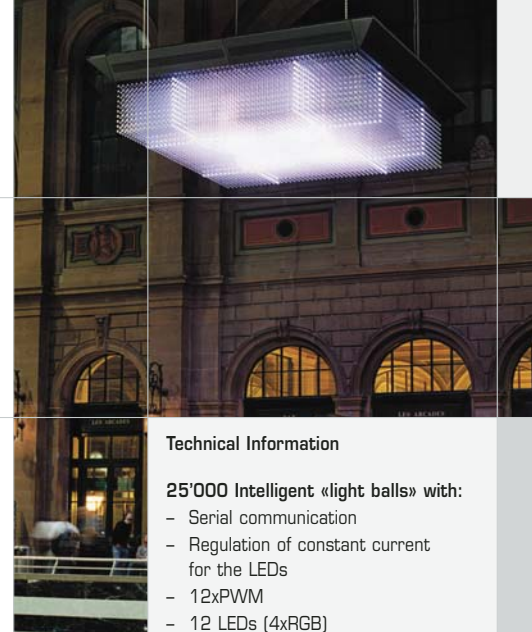
SCS approached the design step by step. First SCS built a 5x5x5 grid of lights and wired the RGB LEDs by hand. The computer graphics lab at ETH Zurich developed a simulation of the entire display and the tools for programming the display. The model of the simulation was adapted according to the simple and low-cost prototype. Then SCS developed the hardware, firmware, and software drivers within 6 months. SCS instructed and supervised subcontractors with the development and construction of the mechanics, cast components, electric control cabinets, wiring, transport, production, and assembly of the display.

The Success

The 3d-display has been in use in Zurich's main train station since September 12th 2006. The NOVA-website invites the public to: «Explore with us the secrets of matter and experience the mathematical formulas as they appear in thousands of colored lights. Day after day. For the next three years. As a moment of peace and amazement during your journey through RailCity Zurich.»

Services provided by Supercomputing Systems AG

System technical project management, feasibility study, prototype construction, development of the hardware, firmware, and software drivers, production supervision.



Technical Information

25'000 Intelligent «light balls» with:

- Serial communication
- Regulation of constant current for the LEDs
- 12xPWM
- 12 LEDs (4xRGB)
- 16 million colors possible
- 25Hz update rate
- Temperature sensor

2'500 LED-Strings with 10 light balls each

- 2 FR4 PCBs, 50cm in length
- SMD-assembly
- Cast component diffuser (ball)

100 module PCB with 25 LED-strings and

- Freescale processor with Ethernet-connection (UDP/IP)
- Cyclone2 FPGA with 25 differential serial interfaces
- 4 power supplies, 230V primary, 120 A x 5 V secondary
- Temperature sensors

Control

- Windows-XP laptop and 16 Ethernet-switches

Power consumption

- Max. 64 kW

Lifespan

- Minimum 3 years

