ENGLISH

Ingo Nussbaumer

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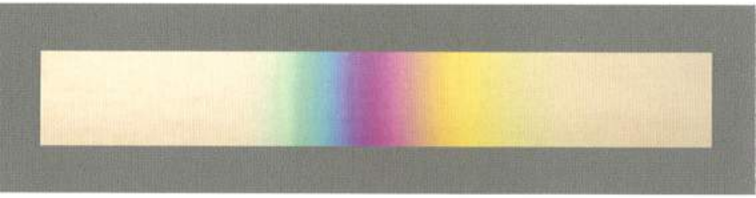
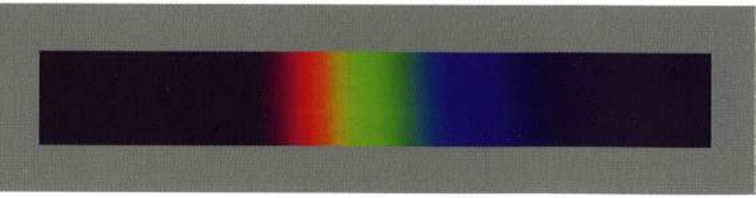
Virtual Color Tubes.
Light, Fragmentation, Restitution

Light Installations

9 projectors, halogen lamps 250 W; 3 slit fixtures and 3 division bars, 3 special template screens made of aluminium (white varnish, iron base; each about 186 × 20.6 cm), 3 special template screens made of cardboard (with satin, perspex inside; each 50 × 50 cm), 7 water prisms (21 × 21 × 21 × 50 cm made of glass). Each object is approximately 9 to 12 metres long.

A characteristic of visible light passing through a prism is that its path is bent and scattered into diverse colours. This phenomenon is called 'dispersion of light'. For it to occur in an experimental situation, a narrow slit is needed in order to effectively limit incoming light so that it fans out into colours. Generally, a narrow *slit diaphragm* is used for this purpose, this being a rectangular opening of approximately the width of a hair. If sunlight or similar visible light is let through such a tiny slit and then through a prism, the familiar *rainbow spectrum* is projected within a certain distance with its primary colours red, green and blue (Fig. 1).
Enter the Viennese artist Ingo Nussbaumer. Basically, his idea is to fragment light continuously separated into individual





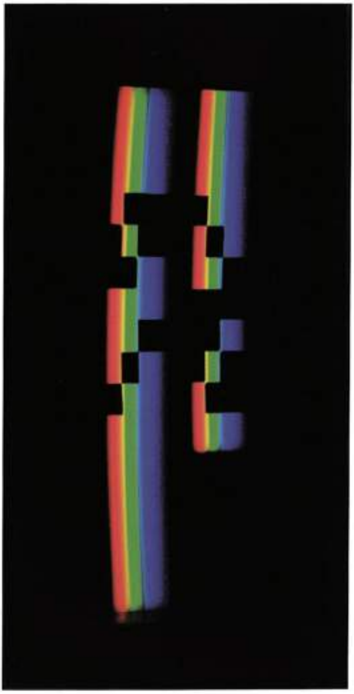
5. *Goethe's Spectra*
1. *Newton's Spectra*

colours with dedicated devices. This idea essentially originates from Isaac Newton, who separated the colours of the spectrum of sunlight, only to allow these beams through a prism again. However, what was accomplished only *step by step* by Newton and the follow-up experiments of physics is achieved by Nussbaumer all at once. With his self-designed special template screens he carves out various parts of the spectrum. In this way, a multifragmented spectrum is created and revealed on the template screens (Fig. 2).

The fragmentation of the spectrum carried out by the special template screens is the first step in creating Nussbaumer's images of light. The second step, directly linked to this, is the reversal of the dispersion of light, for a prism is able not only to disperse white light into colours, but also – and this is a lesser known ability – to focus colours, similarly to a collecting lens. Ingo Nussbaumer calls this process 'image-restitution' (image reset), fulfilled in a complete or incomplete way, depending on whether the whole spectrum or only parts of it are observed through a prism. Thus, Nussbaumer differentiates between *total* and *partial* image-restitution. Total image-restitution occurs when all the colours of the rainbow spectrum are synthesized into white light again. In this case, observed through the prism, glancing at the spectrum, a sharp white slit of light appears, whereas partial image-restitution only occurs when *parts* of the colour spectrum are observed. In this case, certain coloured slits of light appear. For example, the red and blue of the spectrum become a magnificent, vividly glowing pink. The residual colours are synthesized into images according to the respective method of fragmentation (Fig. 3).

This is when the observer comes into play, his task being to glance through the large water prisms and at the special template screens installed in the room, fragmenting and reflecting coloured light. When the prism is looked through, the colours of the spectrum are synthesized into white colour or diverse luminous (perceived) colours, that is to say, different parts of light. The key concepts in the experimental implementation of the artist's light objects are *colour fragmentation* and image *restitution*. The show-stopper of the second step is the multitude of emanating light beams appearing on the optically virtual plane, similar to glow sticks, gleaming in vibrant colours. If we look through the prism, we can see how the coloured slit images – called 'virtual colour tubes' by Ingo Nussbaumer – are arranged in front of our eyes (Fig. 4).

The artist, however, is not only intrigued by this regular process linked directly to the classic experiments of physical optics. Using Goethe's experimental ideas regarding colour, Nussbaumer developed a method that enables the reversal of spectra and their synthesized images. Instead of the classical aperture slot he uses a *shadow bar* (an obstruction to incoming light). This is of the same width or narrowness (approx. 0.2 mm) as the slit or rectangular opening that creates the rainbow spectrum. In this case, the light is bent by the bar casting a shadow through the prism, instead of by the slit. Thus, a *complementary rainbow spectrum* is projected at a certain distance with its primary colours *cyan, magenta* and *yellow* (Fig. 5). This phenomenon is called 'reversed spectrum' or 'Goethe spectrum'. The primary colours

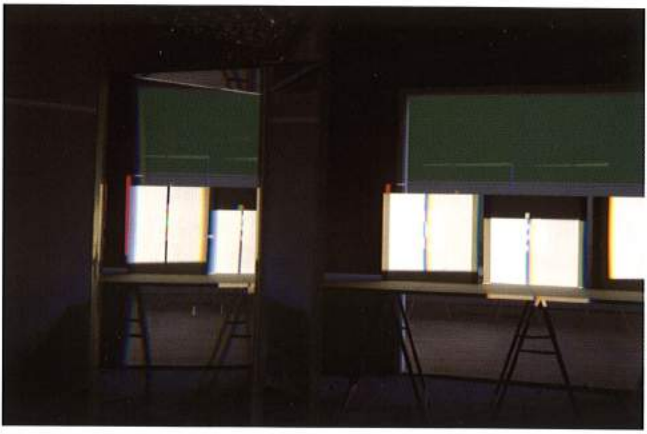


2. ***Newton's Spectra. See, What Happens by Cutting Out.*** Detail. Lightinstallation. Galerie Hubert Winter, Vienna 2009

in this spectrum are the perfect complementary hues of the *normal spectrum* or Newton spectrum **(Fig. 1)**.

The point of the artist's trick is that he is able to fragment the colours of this reversed spectrum in an inverse manner, that is to say, the process backwards. Typically, fragmentation of a spectrum occurs when its parts are left to disappear in dark space. In the case of the reversed process, these beams of light are not released into darkness, but integrated into white light, namely by illuminating the beams with stark white light from the rear through a considerably larger aperture aided by a designated template screen. Hence, the diverse coloured beams disappear from the sight of the observing eye, blending optically into the white surroundings of the emerging spectrum **(Fig. 6)**.

If we look at the inversely fragmented spectra, we may observe that the colours are restituted or constricted into a sharp image. Depending on the method of fragmentation applied, images of various colours appear. However, if all the colours are gathered together, contrary to the ordinary process, not a white slit but a pitch-black opening, a black shadow bar is projected in the light. This hole is a result of an inverted and total image-restitution that is created by way of an inverted spectrum consisting of cyan, magenta and yellow **(Fig. 7)**.
In his light-objects, Ingo Nussbaumer develops such phenomena into serial configurations. The Vasarely Museum presents six such light-objects.



8. *Light Installation,* Humboldt-University, Berlin 2010

Vasarely Museum – Museum of Fine Arts, Budapest

30 September – 27 November 2011

Open daily 10 am – 5.30 pm with the exception of Mondays

Parallel Exhibition / 1
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On the cover: 3. *Newton's Spectra. See, What Happens by Cutting Out.* Detail. Lightinstallation. Galerie Hubert Winter, Vienna 2009.

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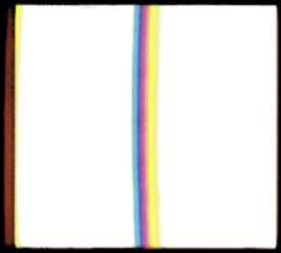
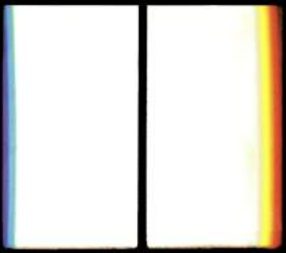




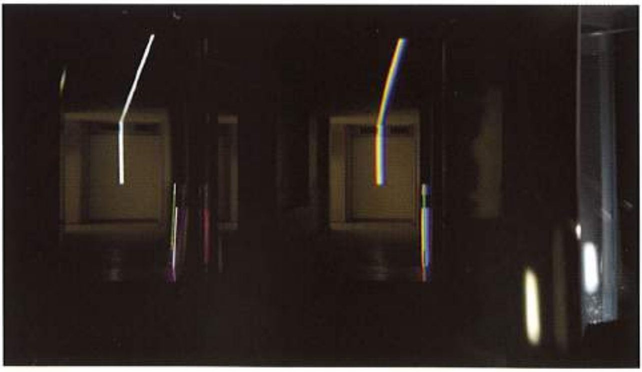
7. Spectrum in an Invers Manner

6. Fragmented Spectrum in an Invers Manner

Ingo Nussbaumer was born in 1956 in Leibnitz, Styria/ Austria. Studied painting and philosophy in Switzerland and Austria. He lives and works in Vienna.

Selected publications: *Zur Farbenlehre, Entdeckung der unordentlichen Spektren.* Edition Splitter Wien 2010.; *Painting as Alignment, Restraint versus Intervention.* Ed. Ingo Nussbaumer, Galerie Hubert Winter, Verlag für moderne Kunst. Nürnberg 2010.

Selected exhibitions: Museum Moderner Kunst Kärnten, Klagenfurt. Center for Contemporary Art, Thessaloniki. Gewerbemuseum Winterthur, Switzerland. Humboldt-Universität, Berlin. ALTANA Galerie (Technische Universität) Dresden. Hellerau – Europäisches Zentrum der Künste. LeRoy Neiman Center for Print Studies, Columbia University School of the Arts, New York. Kassák Múzeum Budapest. Museum on Demand (MUSA); MUMOK, Vienna.



4. ***Light Installation,*** Humboldt-University, Berlin 2010