



# Pink Glasses

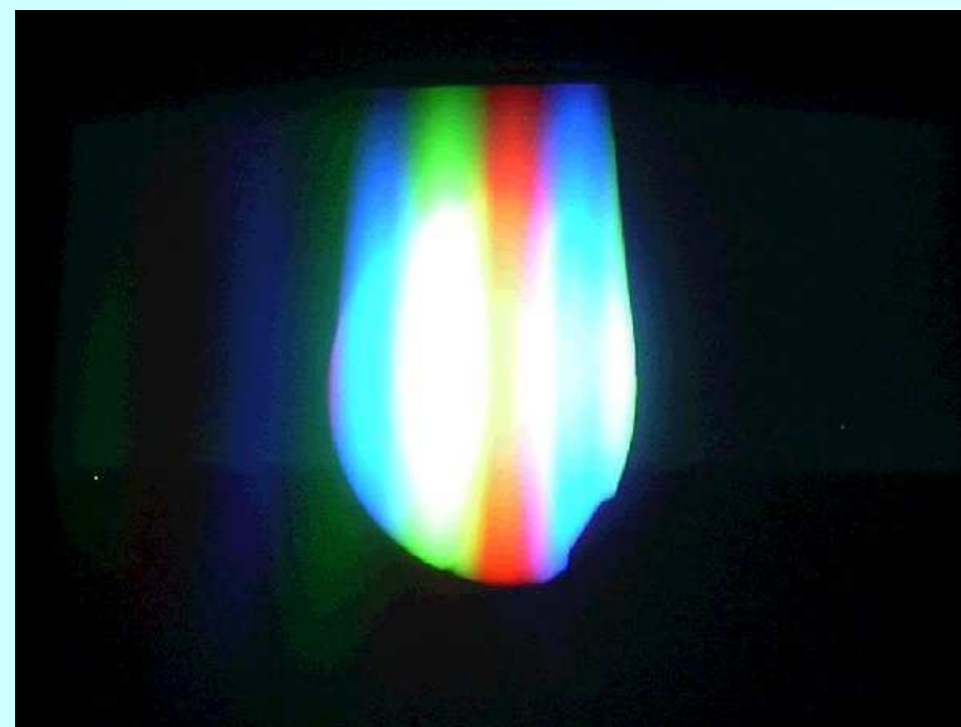


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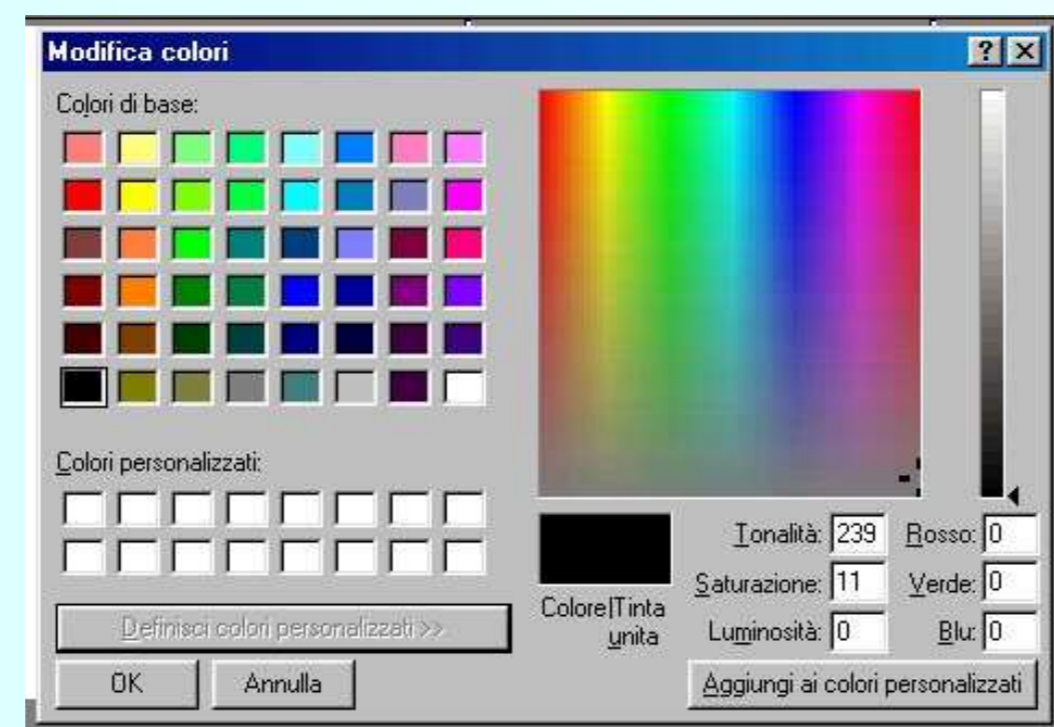
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W. Goethe (the poet) and I. Newton (the physicist) had their own concepts of colours. Now, with lasers and modern technology for selective optical filters we could know much more about spectral composition, but “naked” eye analysis often cheats on the real colours. Remain outside classification the standard classification numerous colours like brown, indigo, siena and so on.

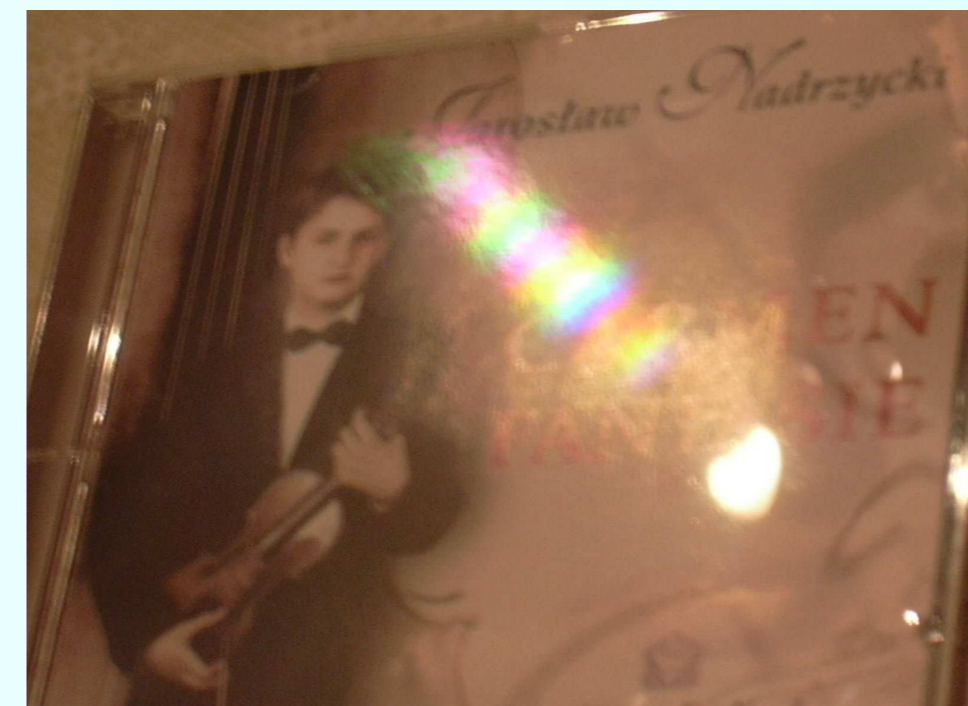
## Basic colours?



So called “basic emission” colors one can see on an old TV set, just after switching it off.



Modern software claims to have 64 million colours. But as you see from this palette they are just **binary mixtures of two neighbors**. Even **violet** is absent!



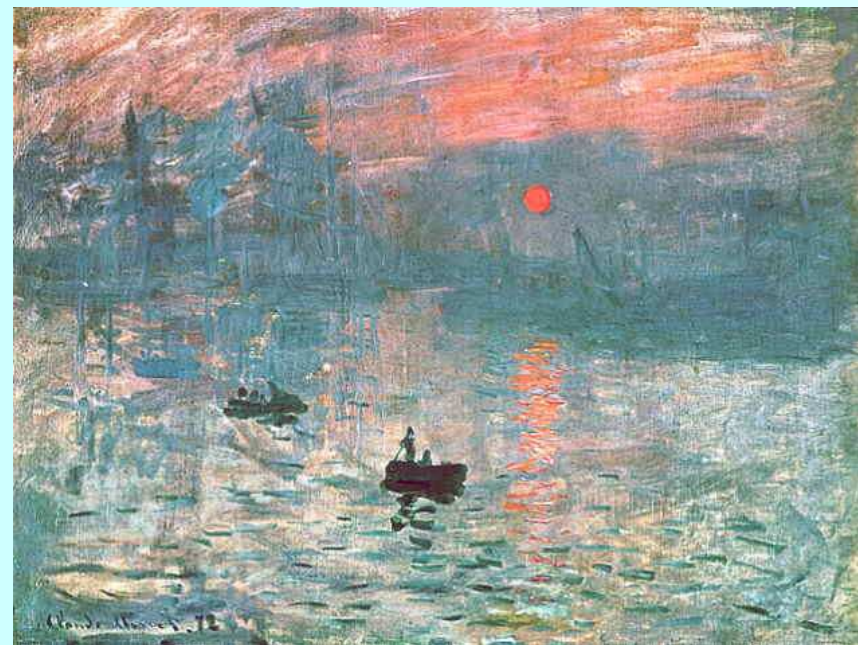
This CD cover of highly oriented polymer acts as a **subtractor** of colours: those of the “proper” length (e.g. red) are subject to Brewster polarization and disappear.



The owner of this shop in Berlin finds it “harmonic” to show three “subtractive” basic colours: cyan, magenta, yellow.

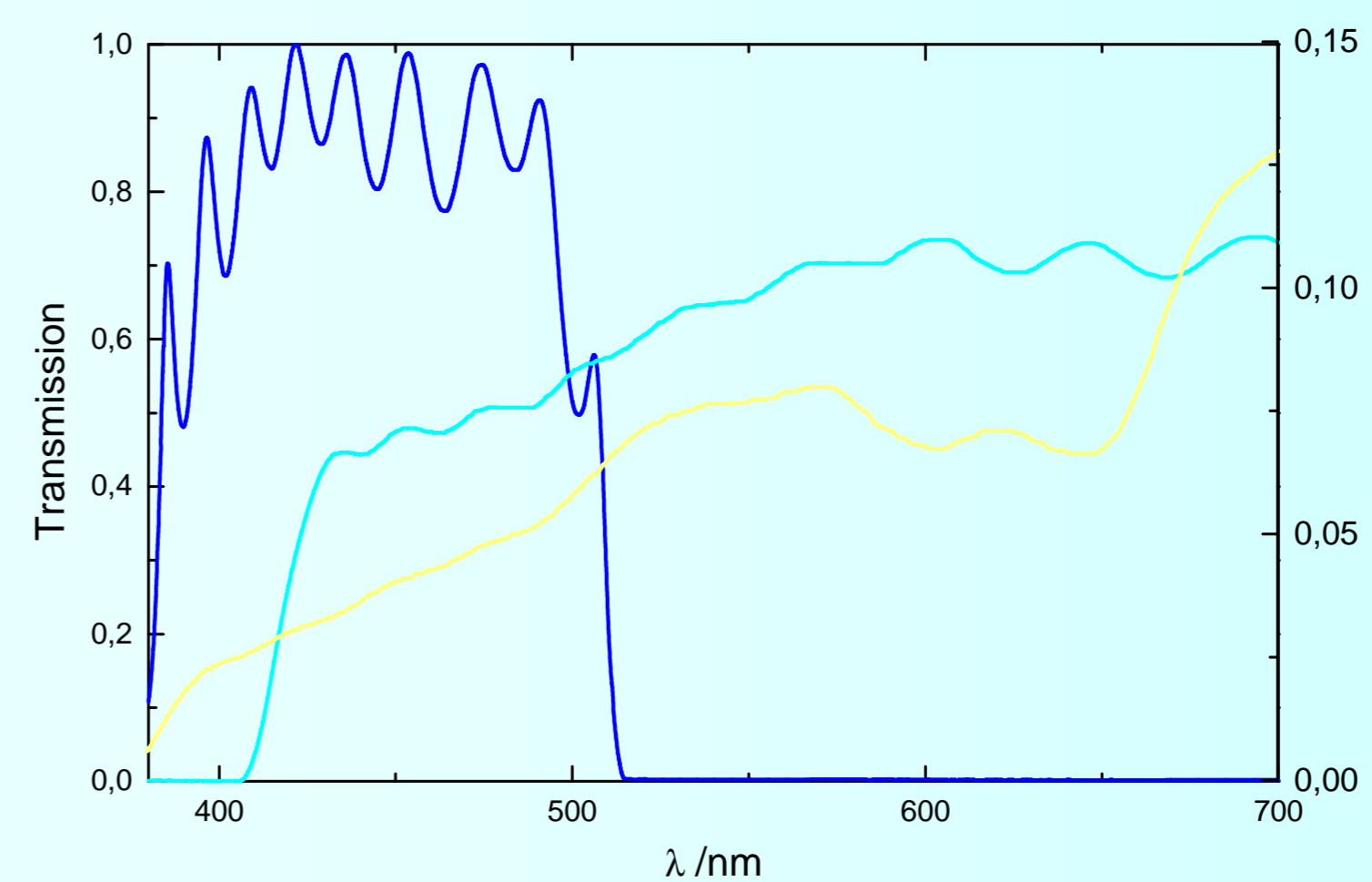
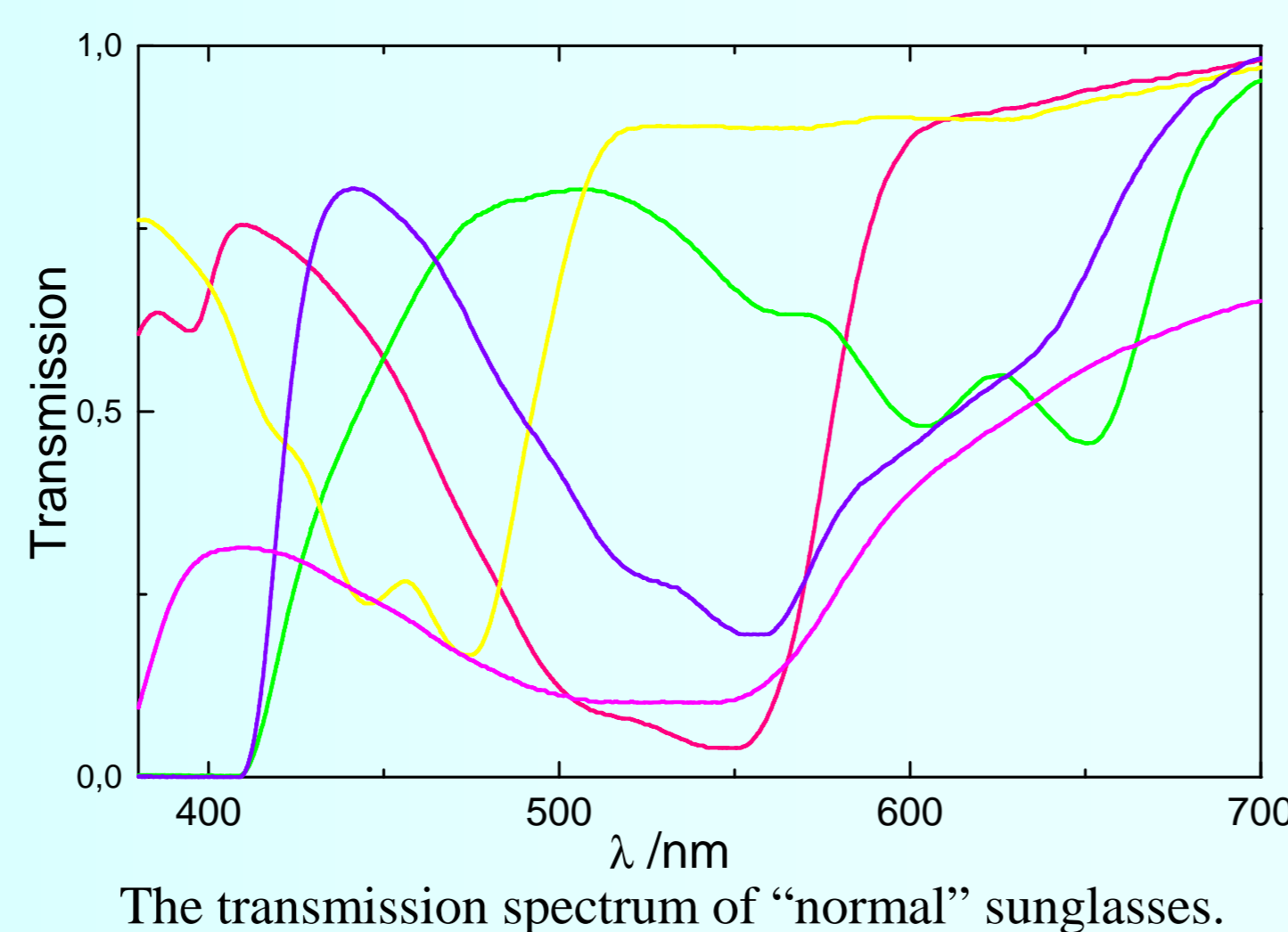
## What colours are?

C. Monet, *Impression - sunrise*



This fundamental question is without a clear answer in physics textbooks. The observation teaches, that sometimes it is the scattered light, sometimes transmitted, sometimes emitted (fluorescence). **Where to find colours? For example in sun glasses.**

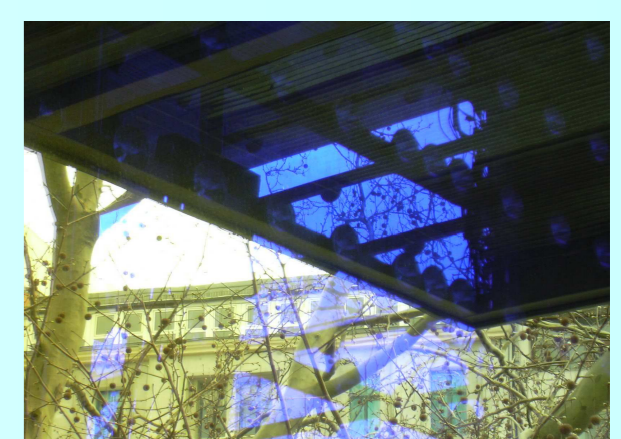
The sunglasses are (at least) of two kinds: the first is “normal” which simply absorbs the light like absorbing filters, the second has a thin layer reflecting light.



The transmission spectrum of high-quality interference filter (in blue) and two types of sunglasses with a thin interference layer.

A simple sunglasses attenuates the intensity of light in the sufficiently broad range of the frequencies. The ones are absorbent filters which contained the many-coloured dyes about complicated characteristics absorption. What seems of a given colour (the green glass) can have a complicated transmission characteristics, with more than one “band”. Some dark glasses can be used as grey filter in some range of frequencies like the black sunglasses from 425 nm to 640 nm.

The “interference” glasses are covered with multilayers of oxides, subsequent of low and high refraction index. They change colour, if you look under a different angle. They show complementary colours in transmission and reflection, like this window in Europe tower in Berlin.



## Basic colours?

So is it possible to find basic colours? Yes, but not so easy. The glass toy filters shown to the left exhibit low-pass band characteristics: the combination of deep blue and yellow is the rest of the spectrum, i.e. red. Another set, of plastic filters, are band-filters, transmitting a narrow range. And the Swarovski pyramids do **ternary additive** combinations.



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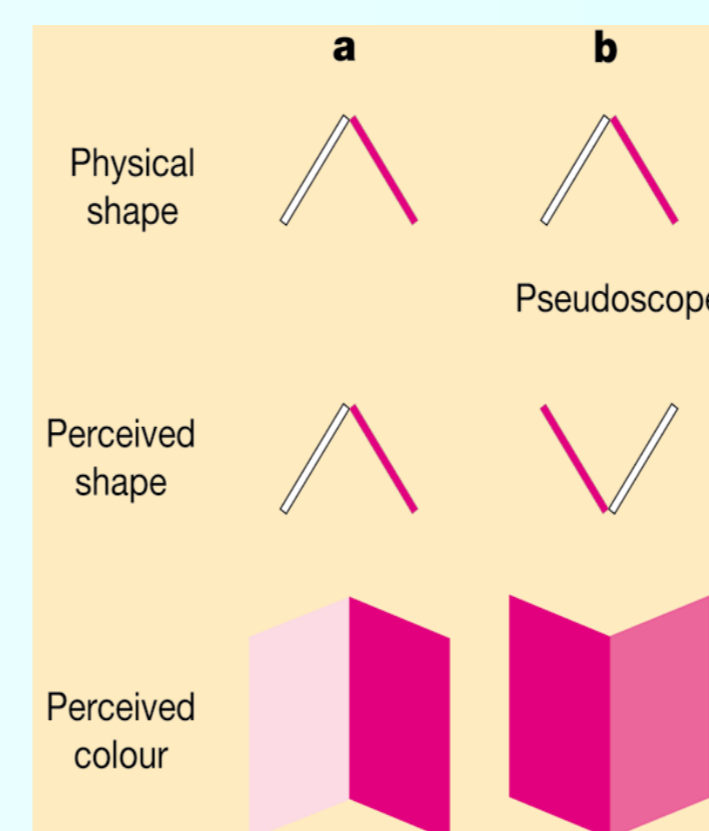
(23/12/1999);

Visual Perception:

Reflections on

colour constancy

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As shown by recent studies, perception of colours depend even on our tri-dimensional conviction. So, maybe artists should be still admitted as professors of colours?

