Visit www.leXsolar.de to learn more about our products for education in renewable energies, e.g.:

solar experiment kits

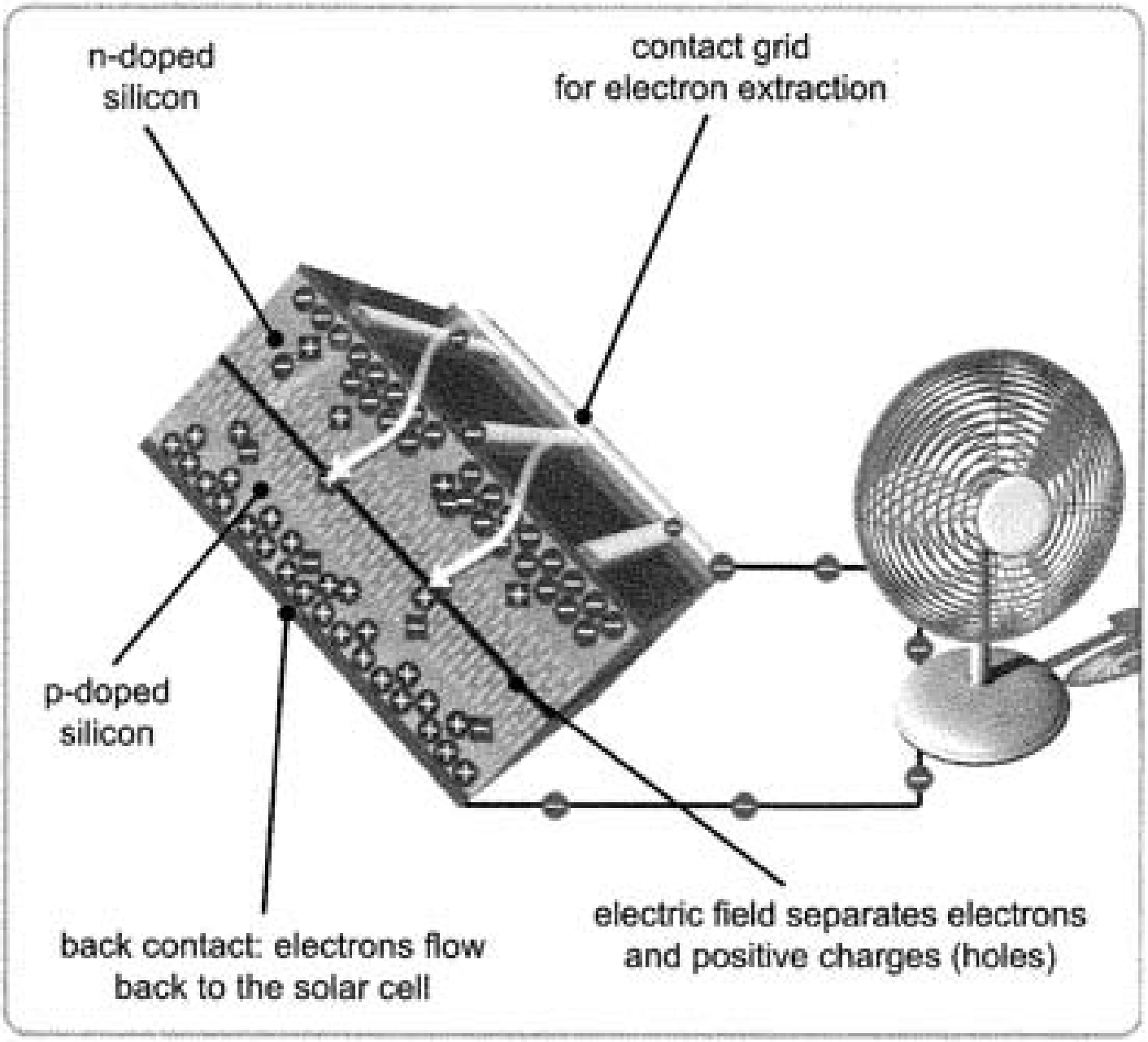
solar experiment toys

How is a solar cell working

A solar cell converts light directly into electric energy. Solar cells mostly consist of silicon - a semiconductor material that absorbs sunlight well.

When producing solar cells, impurities are added to the silicon wafers intentionally - with different impurities from both sides. This so called doping causes an electric field inside the solar cell.

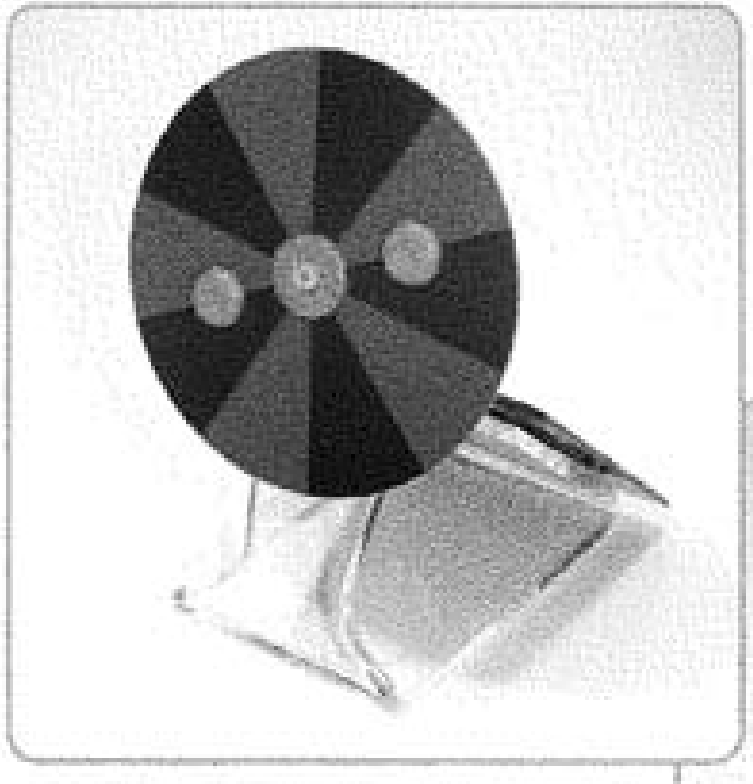
Absorption of light in the solar cell results in excitation of electrons which are then pushed out of the solar cell by the electric field. This causes an electric current that can power devices.

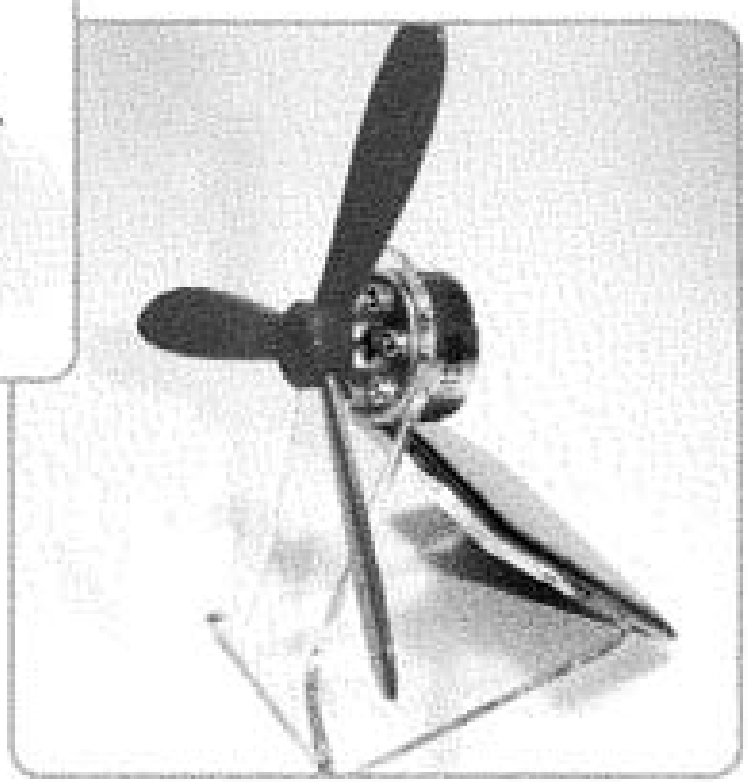


How is leXsolar-Experiment Small working?

leXsolar-Experiment small allows easy experiments with the solar cell and is a great eye-catcher on your desk.

If there is enough light the motor is rotating. On the motor shaft either the red propeller or the blue disc can be plugged. With the blue clips the different carton discs can be attached to the blue disc. To remove the carton discs, the clips has to be pressed out from the backside.



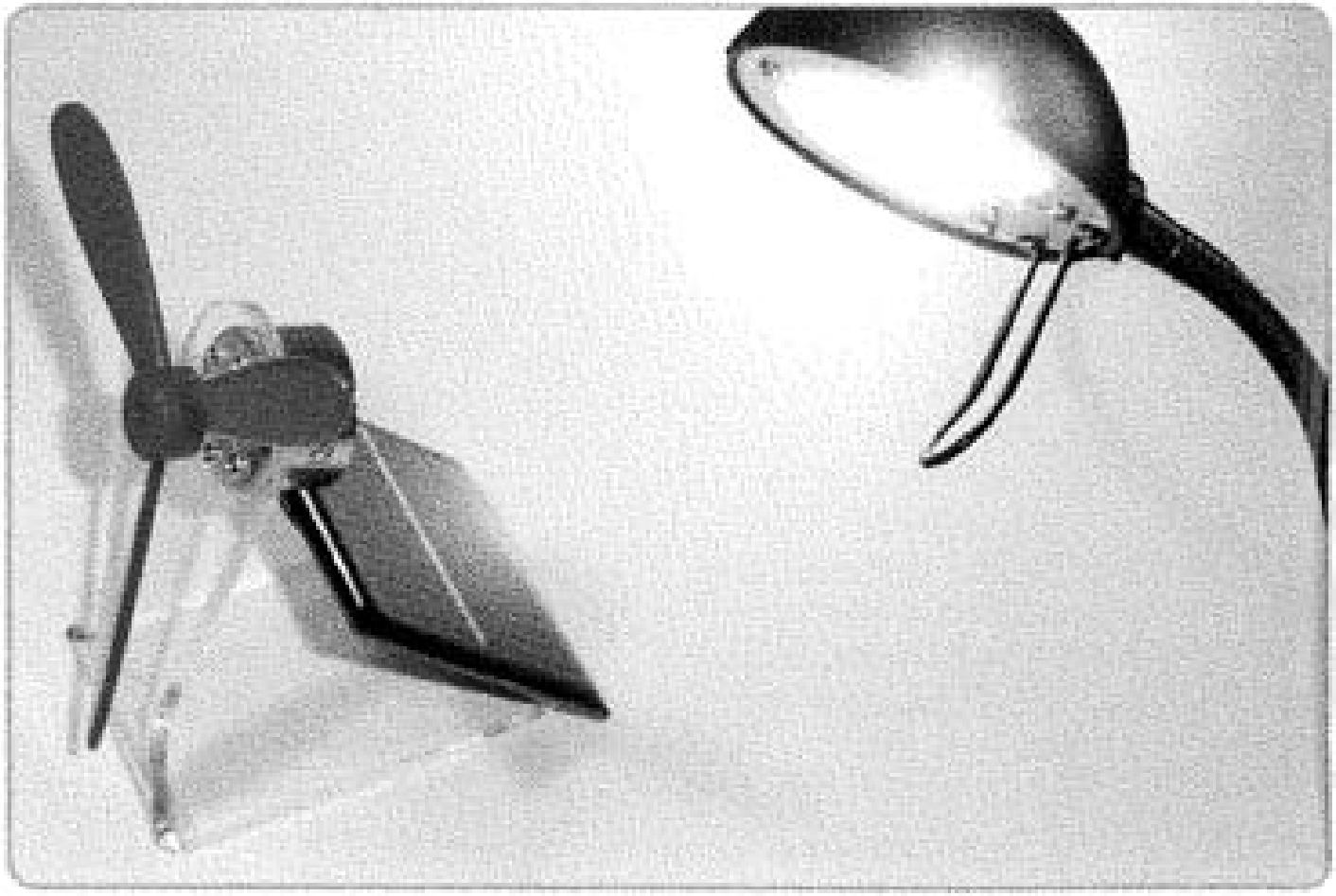


On the following pages easy experiments are described.
On page 10 you can find the results and solutions.

Dependence on the distance to light source

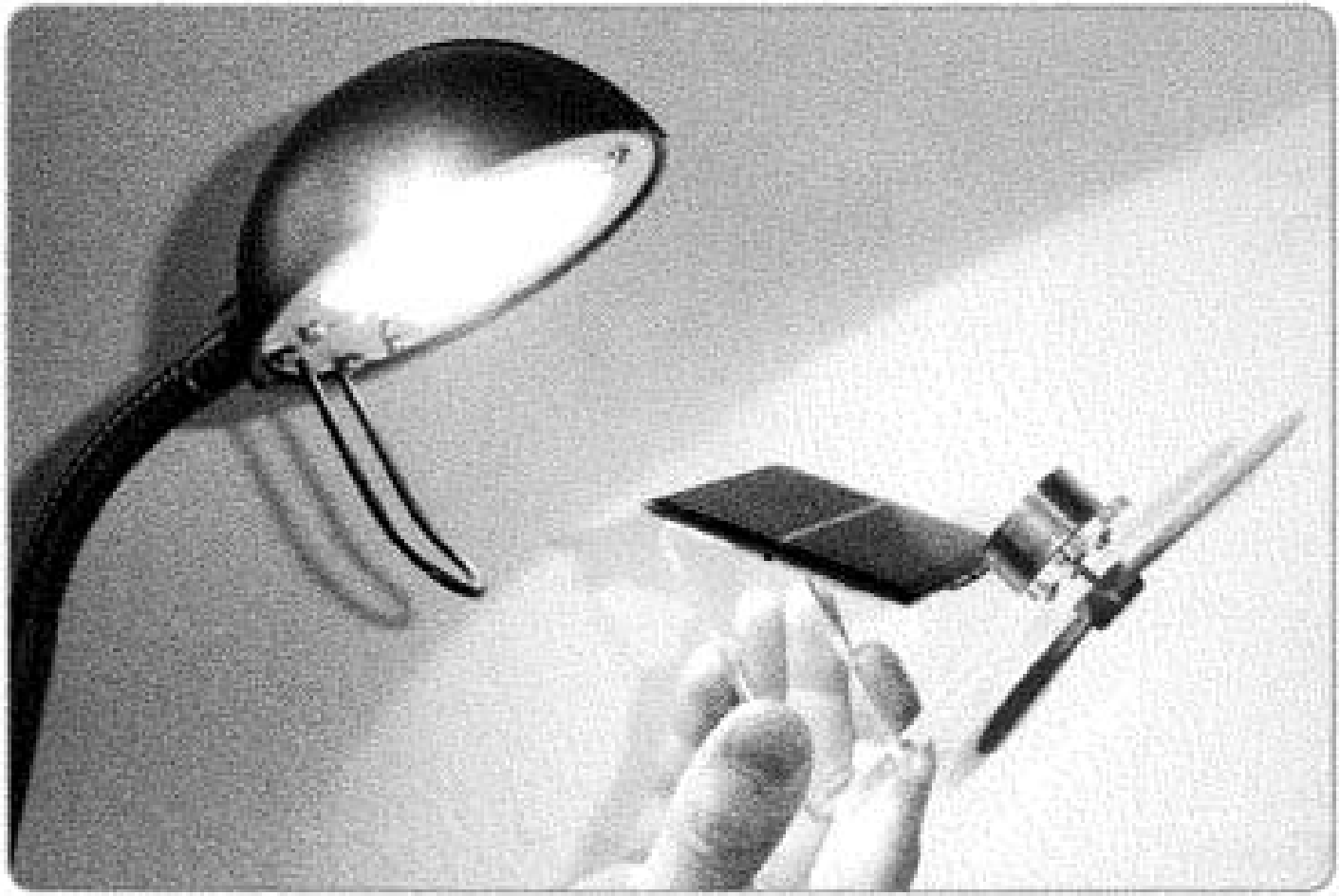
What happens if the solar cell is moved closer to a lamp?

What happens if the solar cell is moved closer to the sun?



Angle of incidence

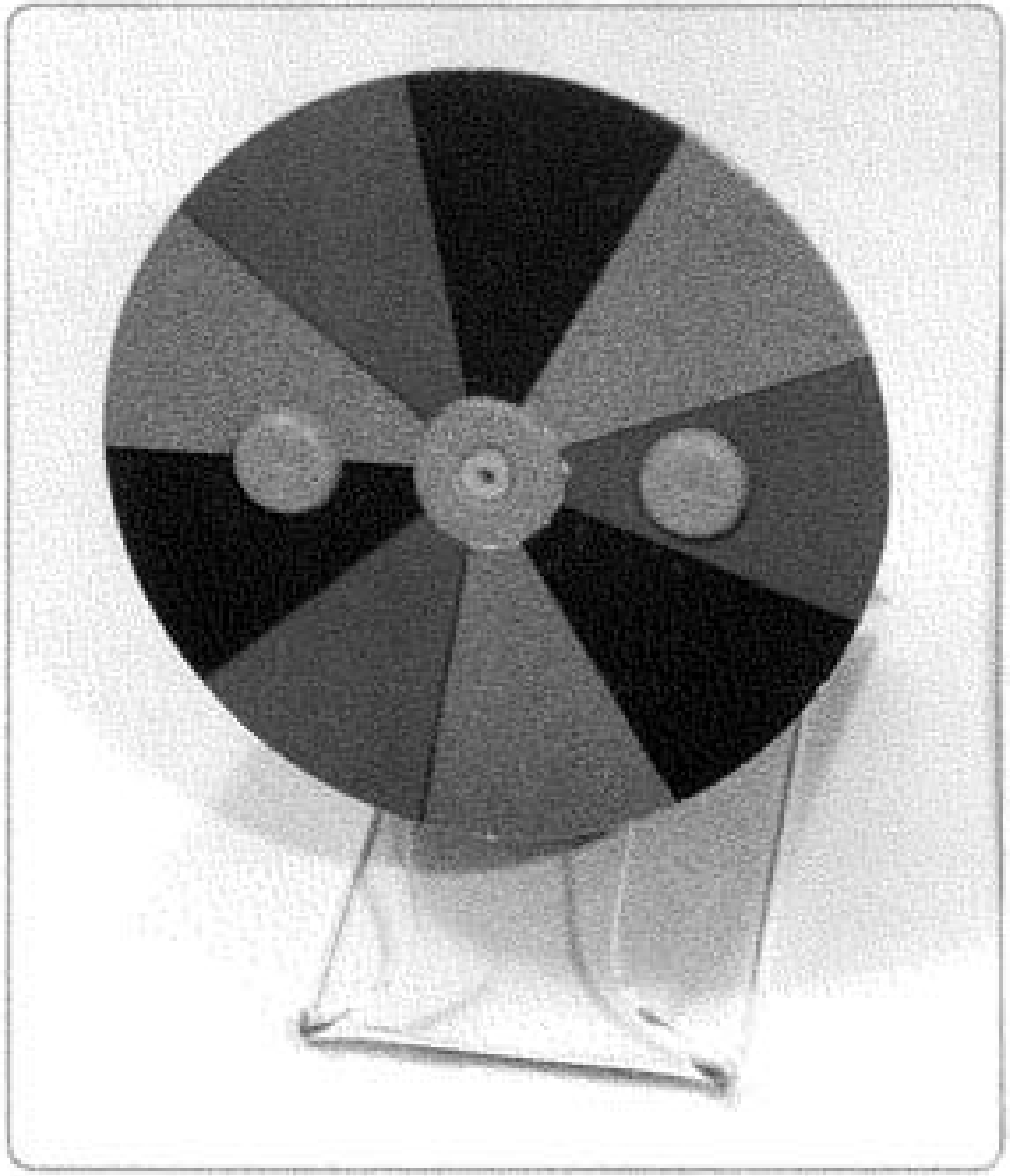
What happens if the solar cell is tilted relatively to the incident light?



Colour discs

Which colour appears when the red-blue colour disc is rotating fast?

Which colour appears when the red-blue-green colour disc is rotating fast?



Optical illusions

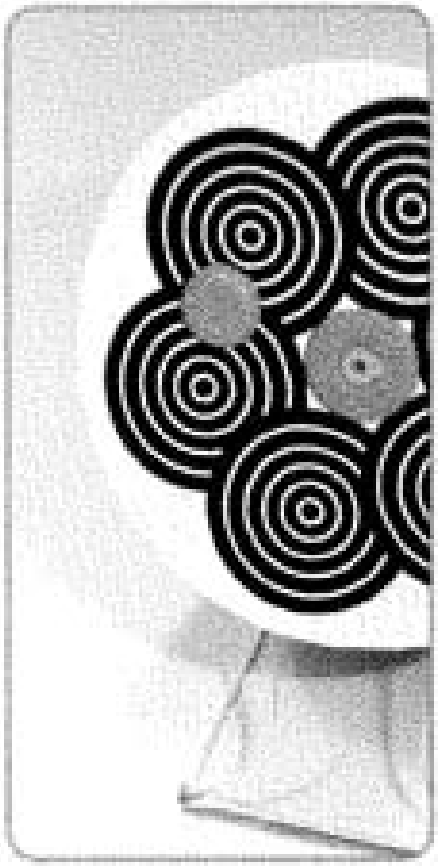
Which effect can be seen when the spiral disc is rotating not too fast? To reduce the rotational speed the solar cell can be shaded by hand partially.

What can be observed when the relief disc is rotating slowly? The rotational speed should be decreased compared to the previous experiment.

Which effect appears when the circle disc is rotating slowly?

spiral disc

relief disc



circle disc

Results

As closer the solar cell is moved towards a lamp as more light can be caught by the solar cell and as faster the motor is rotating. With the sun this does not work – one would have to move some million kilometers closer to the sun to see an effect.

As more the solar cell is tilted away from the light source as less light is coming to the solar cell and as slower the motor is rotating.

When the disc is rotating fast enough our eyes can not follow the individual colours but mix them up. Red and blue become violet. Red, blue and green become white – or depending on the light source rather a kind of grey tone.

Carrying out these experiments one has to zoom in on the discs to see the described effect. The black line on the spiral disc seems to wind off and to run off the disc. The relief disc seems to become stereoscopic. It seems like one is looking into a tube. On the circle disc it looks like all circles would rotate individually.