

TECHNOLOGY OFFERS

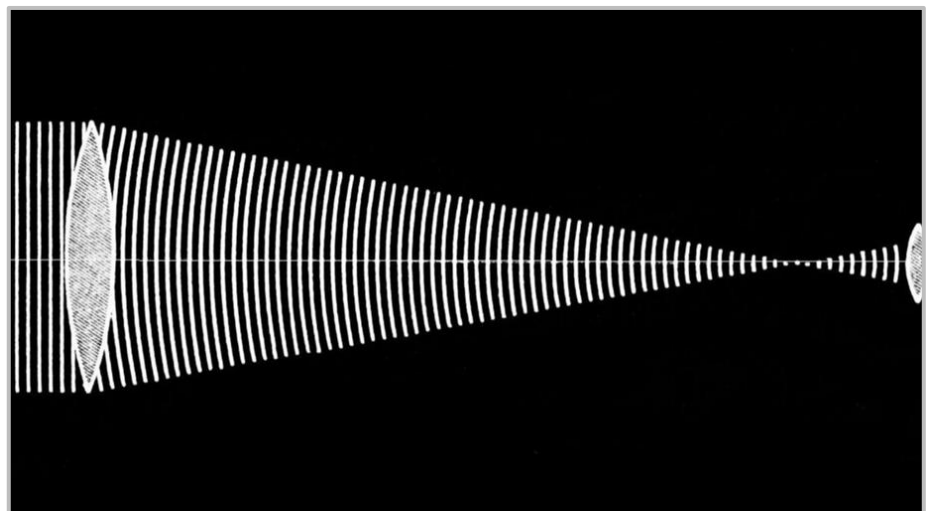
Chromatic Phase Plate for Nanoscopy (P-1146)

A chromatic phase plate designed for STED or RESOLFT fluorescence light microscopy that shapes the wavefronts of stimulation light.

EXECUTIVE SUMMARY

A DKFZ researcher has developed a new chromatic phase plate that contains different stacks of optical flats along a main axis. The individual stacks show no effective differences regarding optical path length for the excitation light of STED and RESOLFT microscopy, but alter the corresponding stimulation light (Figure). This design ensures an intensity minimum of a wide range of wavelengths of stimulation light at the focus point without affecting the excitation light.

The presented technology provides a chromatic phase plate that allows for a much wider (many 10 nm) wavelength range that shapes the wavefronts of stimulation light, resulting in an intensity minimum at the focus point while, at the same time, extending the range of excitation light formed to a regular focus spot.



Popular Science Monthly, CC0

Category

Microscopy

Indication

Development stage

Prototype

Seeking

Licensing

BENEFITS

- Chromatic phase plate designed for STED or RESOLFT fluorescence light microscopy
- Wavefronts of excitation light are unaffected
- Wavefronts of stimulation light over a wide range of wavelengths are shaped

TECHNOLOGY BACKGROUND

In order to achieve an ideal STED and RESOLFT fluorescence light microscopy result it is essential to generate a local intensity minimum at the focus point for stimulating or fluorescence-inhibiting light. On the other hand excitation light has to display a local intensity maximum at the focus point. Traditional chromatic waveplates are limited especially by a narrow wavelength range for the stimulating beam (typically +/- 5nm).

DEVELOPMENT STAGE

Point spread function calculations for the systematic selection of the required glass combinations are available for desired wavelength ranges.

APPLICATIONS

The chromatic phase plate is particularly suitable for STED or RESOLFT fluorescence light microscopy. Laser with wider wavelength ranges such as TiSa laser can be used with the chromatic phase plates presented here. A single phase plate can be used to match a number of laser lines from lasers such as RAMAN comb lasers without replacing and readjusting the system.

INTELLECTUAL PROPERTY

Patent application submitted.

- The patent application "Chromatic phase plate" was filed 19.10.2015 at the EPO. A subsequent PCT has been published as WO2017067998A1. Patent applications pending in Europe (EP3365721A1) and USA (US20180231788A1).

PUBLICATIONS & REFERENCES

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DKFZ Contact:

Dr. Frieder Kern
Deutsches Krebsforschungszentrum
Innovation Management, T010
Email: F.Kern@dkfz.de
Tel.: +49-(0)6221-42-2952
Fax: +49-(0)6221-42-2956

ABOUT THE DKFZ INNOVATION MANAGEMENT

Working at the interface of research and industry, the Innovation Management of the German Cancer Research Center (DKFZ) helps to get new cancer medications, diagnostic tests, and research instruments onto the market as quickly as possible.

The DKFZ with its more than 3,000 employees is the largest biomedical research institution in Germany. At the Center more than 1,300 scientists investigate how cancer develops, identify cancer risk factors and endeavor to find new strategies to prevent people from getting cancer. They develop novel approaches to make tumor diagnosis more precise and treatment of cancer patients more successful. DKFZ is a member of the Helmholtz Association of National Research Centers, with ninety percent of its funding coming from the German Federal Ministry of Education and Research and the remaining ten percent from the State of Baden-Württemberg

