Polarymetria w świetle białym

1. Ocena różnicy dróg optycznych metodą analizy barwy
2. Figury konoskopowe

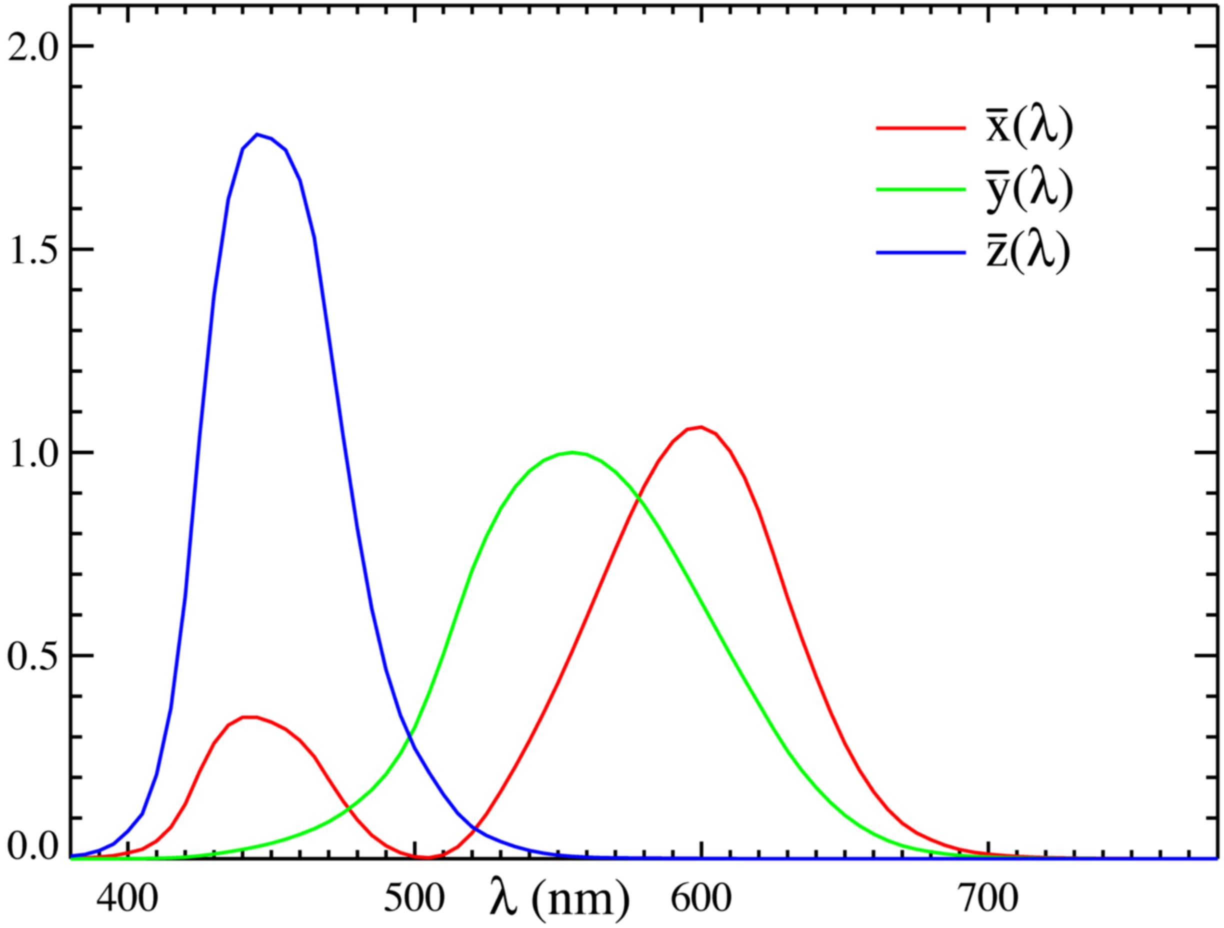
Polaryskop

- Wzór polaryskopowy

$$I_{out} = I_0 T_M^2 \sin^2(2\alpha_f) \cdot \sin^2\left(\pi \frac{R}{\lambda}\right)$$

$$\lambda_m \rightarrow R_m = \lambda_m N_m \;\Rightarrow I_{out}(\lambda_m) = 0$$

Widzenie barwne



Widzenie barwne

$$a=\int_{380}^{780}\bar{x}(\lambda)I(\lambda)d\lambda=\int_{380}^{780}\bar{x}(\lambda)I_0(\lambda)T_M^2(\lambda)\sin^2\left[\frac{\pi R(\lambda)}{\lambda}\right]d\lambda$$

$$b=\int_{380}^{780}\bar{y}(\lambda)I(\lambda)d\lambda=\int_{380}^{780}\bar{y}(\lambda)I_0(\lambda)T_M^2(\lambda)\sin^2\left[\frac{\pi R(\lambda)}{\lambda}\right]d\lambda$$

$$c=\int_{380}^{780}\bar{z}(\lambda)I(\lambda)d\lambda=\int_{380}^{780}\bar{z}(\lambda)I_0(\lambda)T_M^2(\lambda)\sin^2\left[\frac{\pi R(\lambda)}{\lambda}\right]d\lambda$$

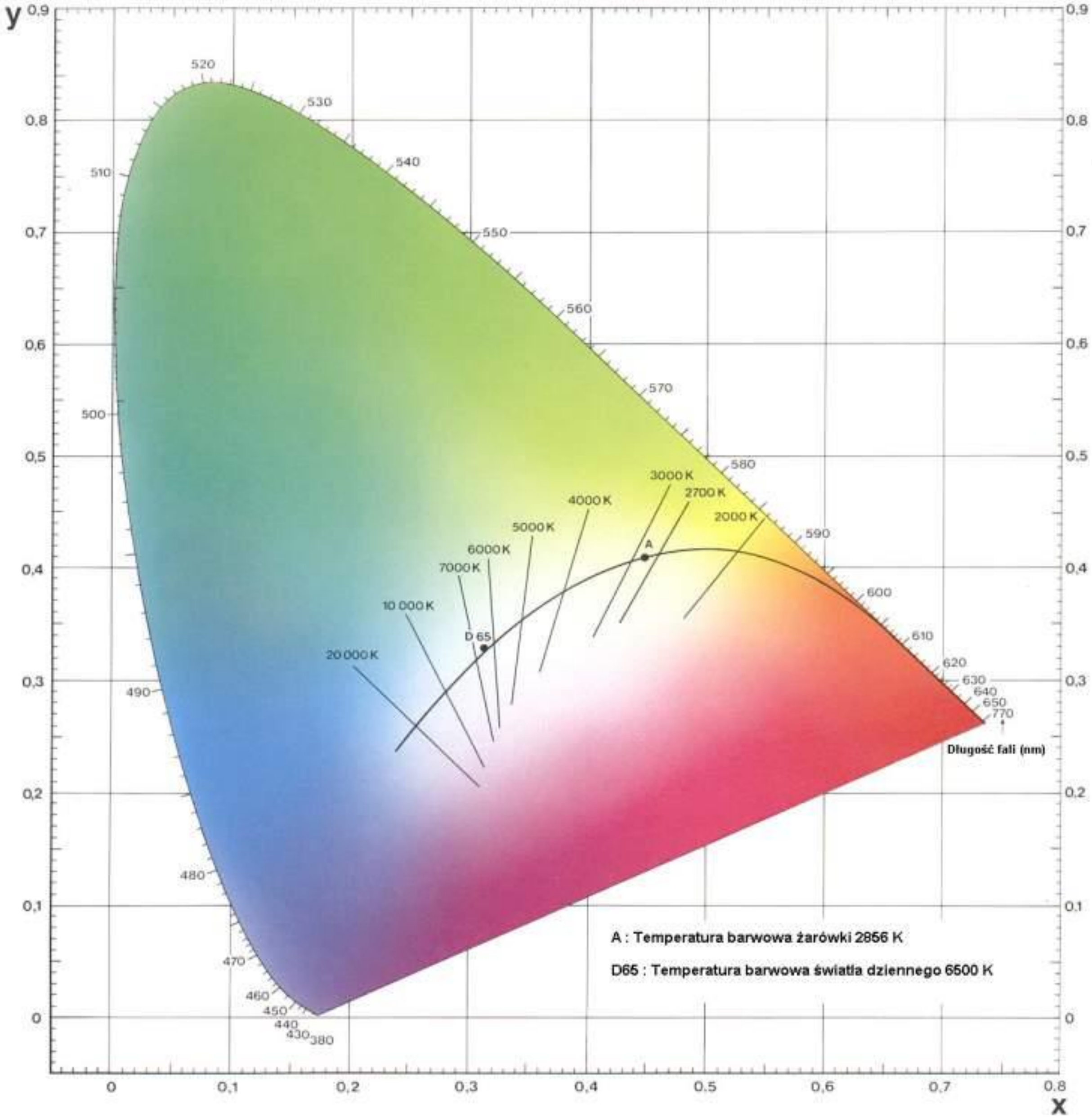
Widzenie barwne

$$x = \frac{a}{a+b+c},$$

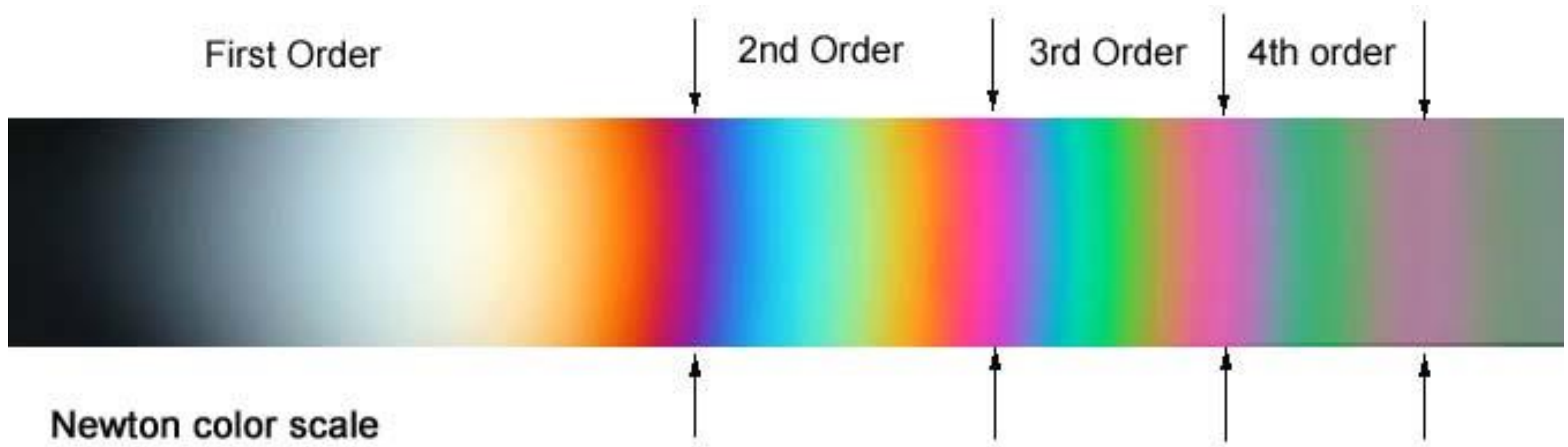
$$y = \frac{b}{a+b+c},$$

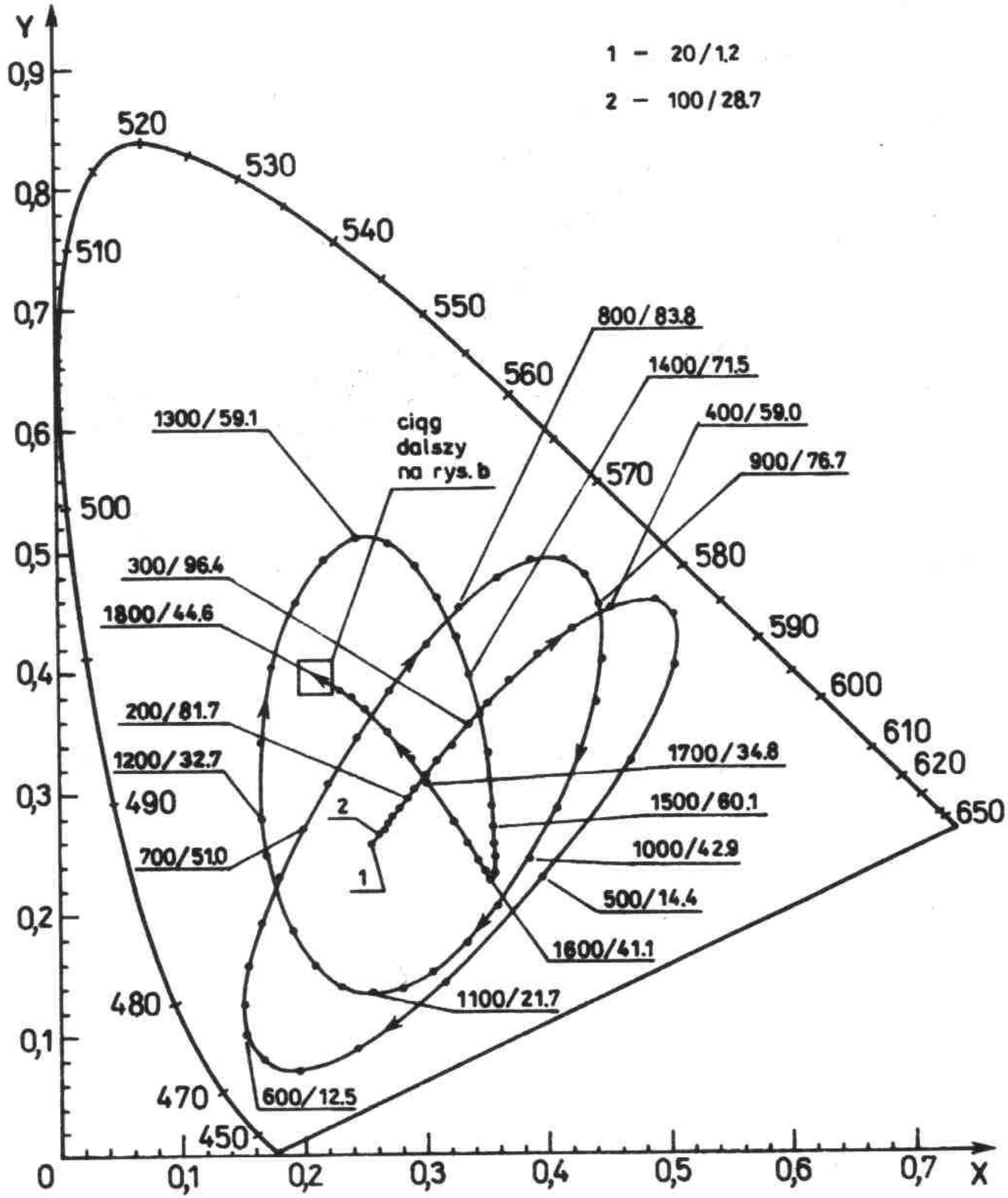
$$z = \frac{c}{a+b+c}.$$

Widzenie barwne



Skala barw Newtona




1 – 20/1,2
2 – 100/28,7
Y
X
0
0,1
0,2
0,3
0,4
0,5
0,6
0,7
0,8
0,9
450
470
480
490
500
510
520
530
540
550
560
570
580
590
600
610
620
650
ciąg dalszy na rys. b
800/83.8
1400/71.5
400/59.0
900/76.7
1300/59.1
300/96.4
1800/44.6
200/81.7
1200/32.7
700/51.0
1700/34.8
1500/60.1
1000/42.9
500/14.4
1600/41.1
1100/21.7
600/12.5
1
2

Rozpoznawanie azymutu próbki

- Dodatkowa Płytka fazowa o znanej różnicy faz R_p oraz znanym kącie azymutu

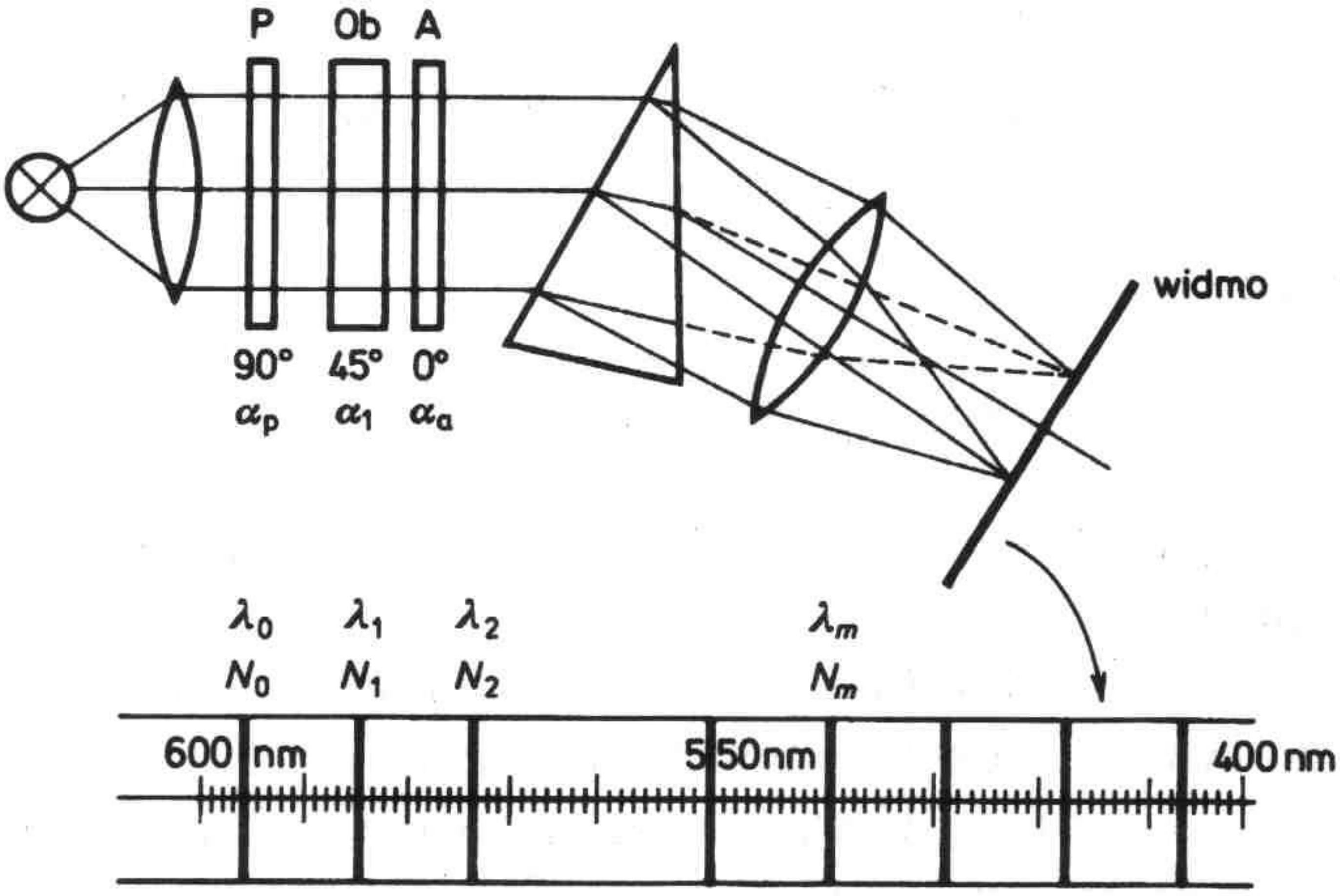
- Azymuty zgodne: „podwyższenie" barwy

$$R' = R + R_p$$

- Azymuty przeciwne: „obniżenie" barwy

$$R' = R - R_p$$

Metoda analizy spektralnej – pomiar różnicy dróg optycznych



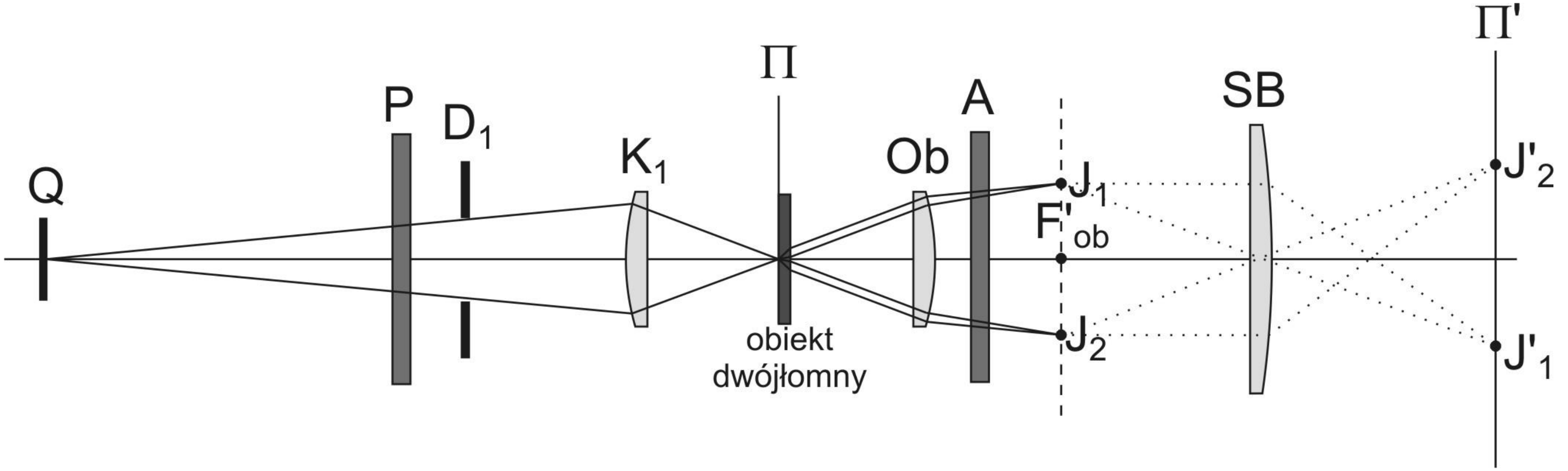
Metoda analizy spektralnej – pomiar różnicy dróg optycznych

$$\lambda_0 \rightarrow R_0 = \lambda_0 N_0 \qquad \lambda_m \rightarrow R_m = \lambda_m N_m$$

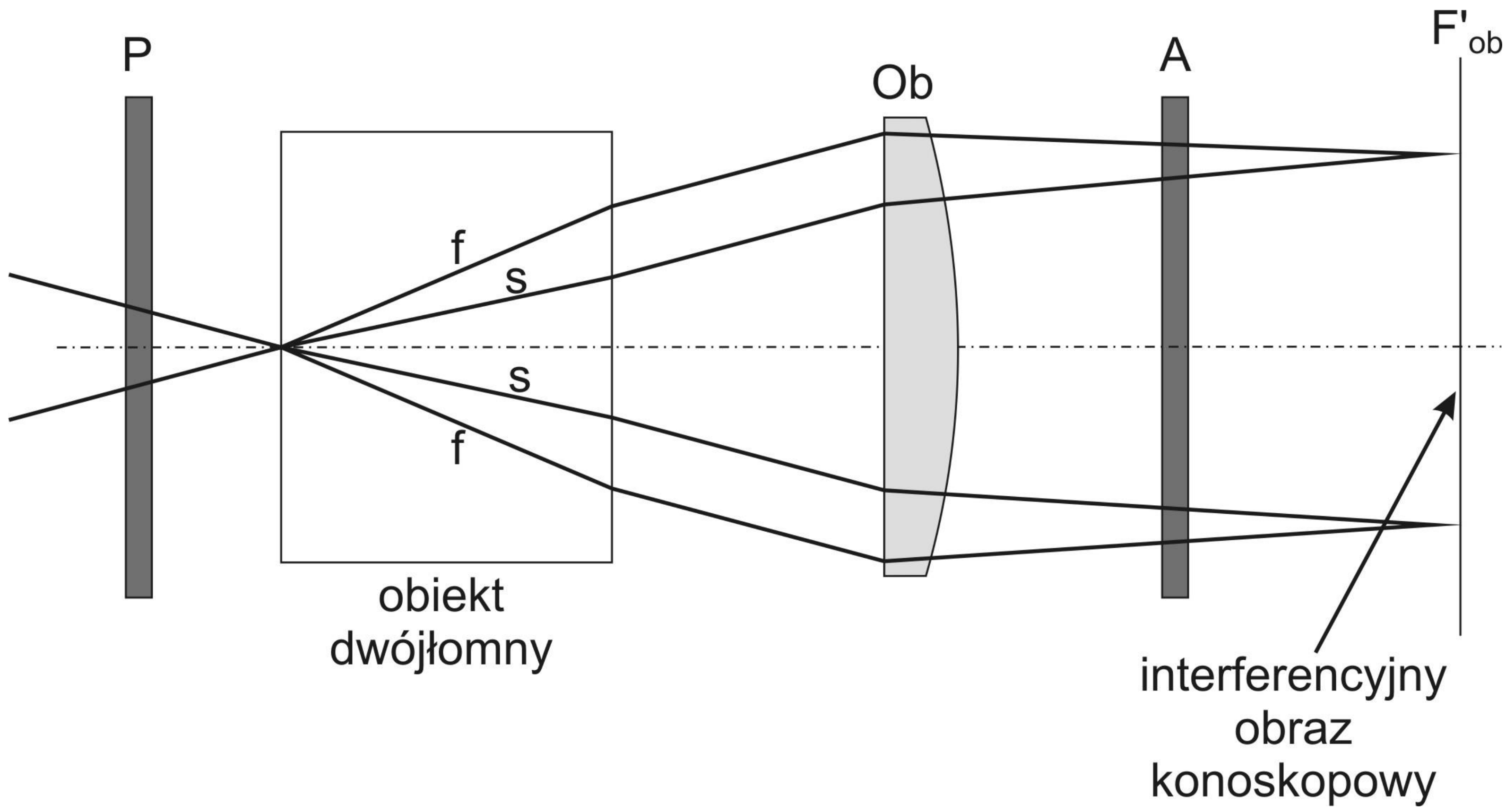
$$N_m = N_0 + m$$

$$R_0 = m\left|\frac{\lambda_0 \lambda_m}{D\lambda_0 - \lambda_m}\right| \qquad D = \frac{\left(n_s - n_f\right)_m}{\left(n_s - n_f\right)_0}$$

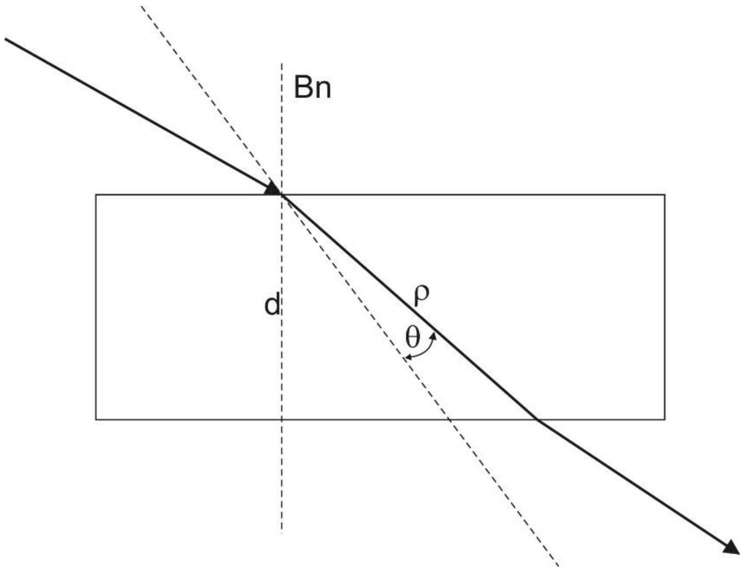
Figury konoskopowe

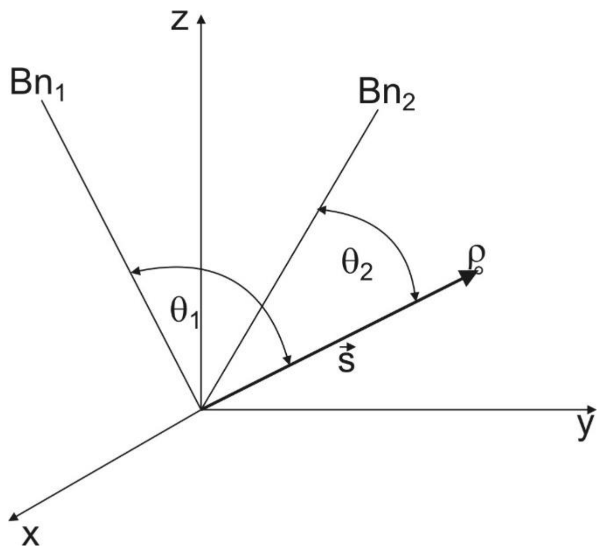


Interferencja



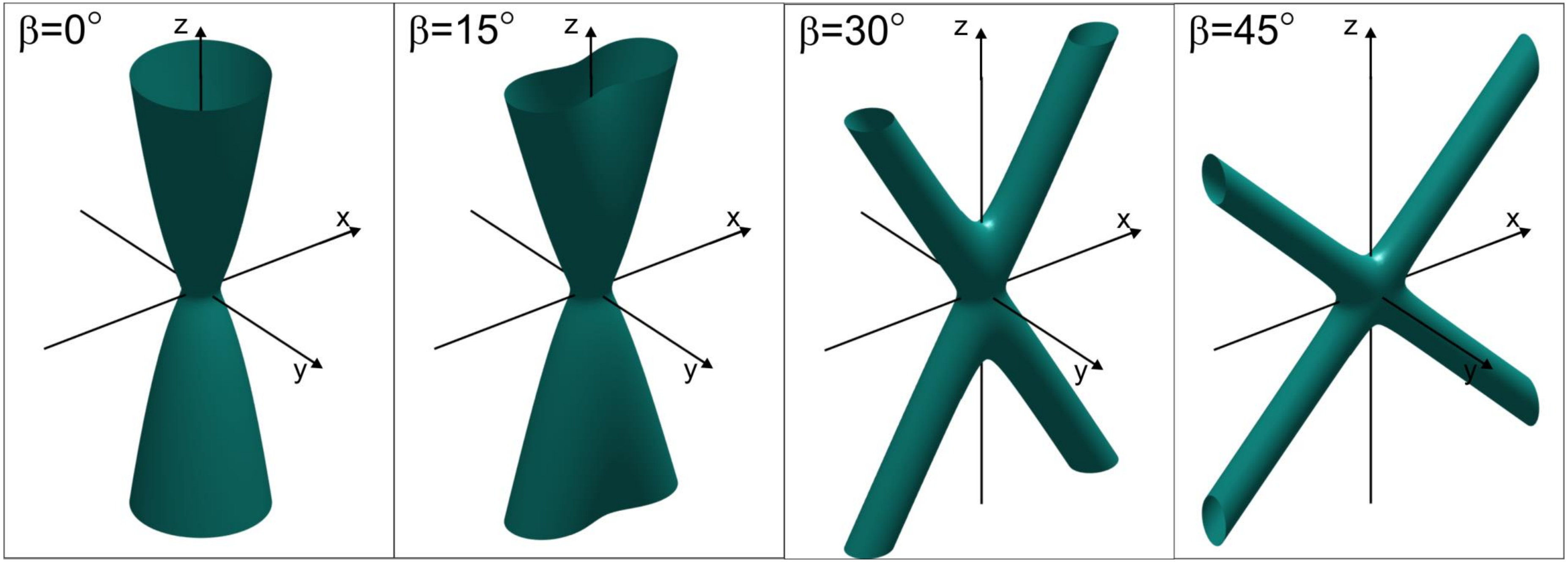
Izochromy





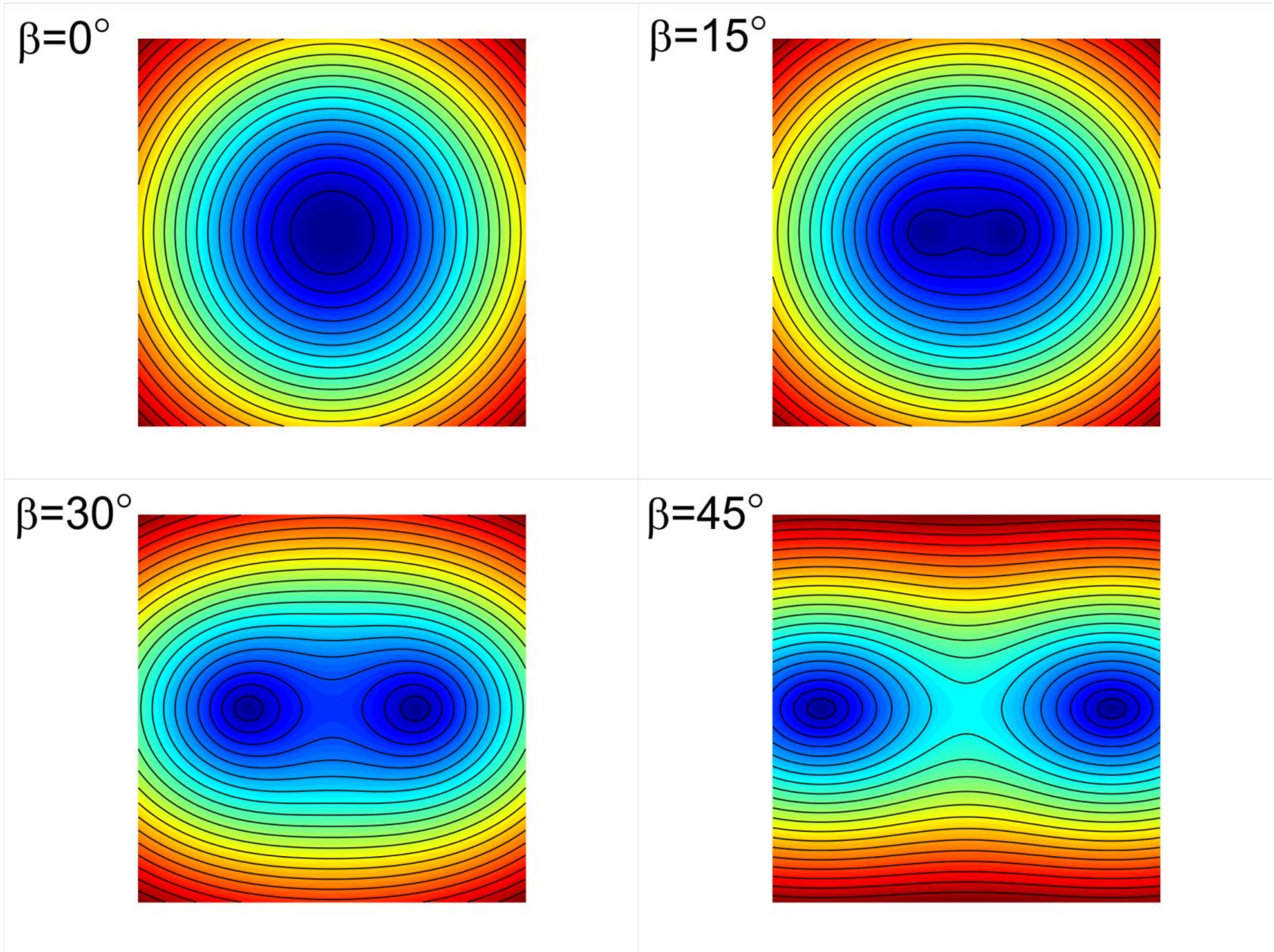
$$\left(N\lambda\right)^2=\left(x^2+y^2+z^2\right)\left(n_z-n_x\right)^2\left[1-\frac{\left(z\cos\beta+x\sin\beta\right)^2}{x^2+y^2+z^2}\right]\left[1-\frac{\left(z\cos\beta-x\sin\beta\right)^2}{x^2+y^2+z^2}\right]$$

Rozkłady izochrom



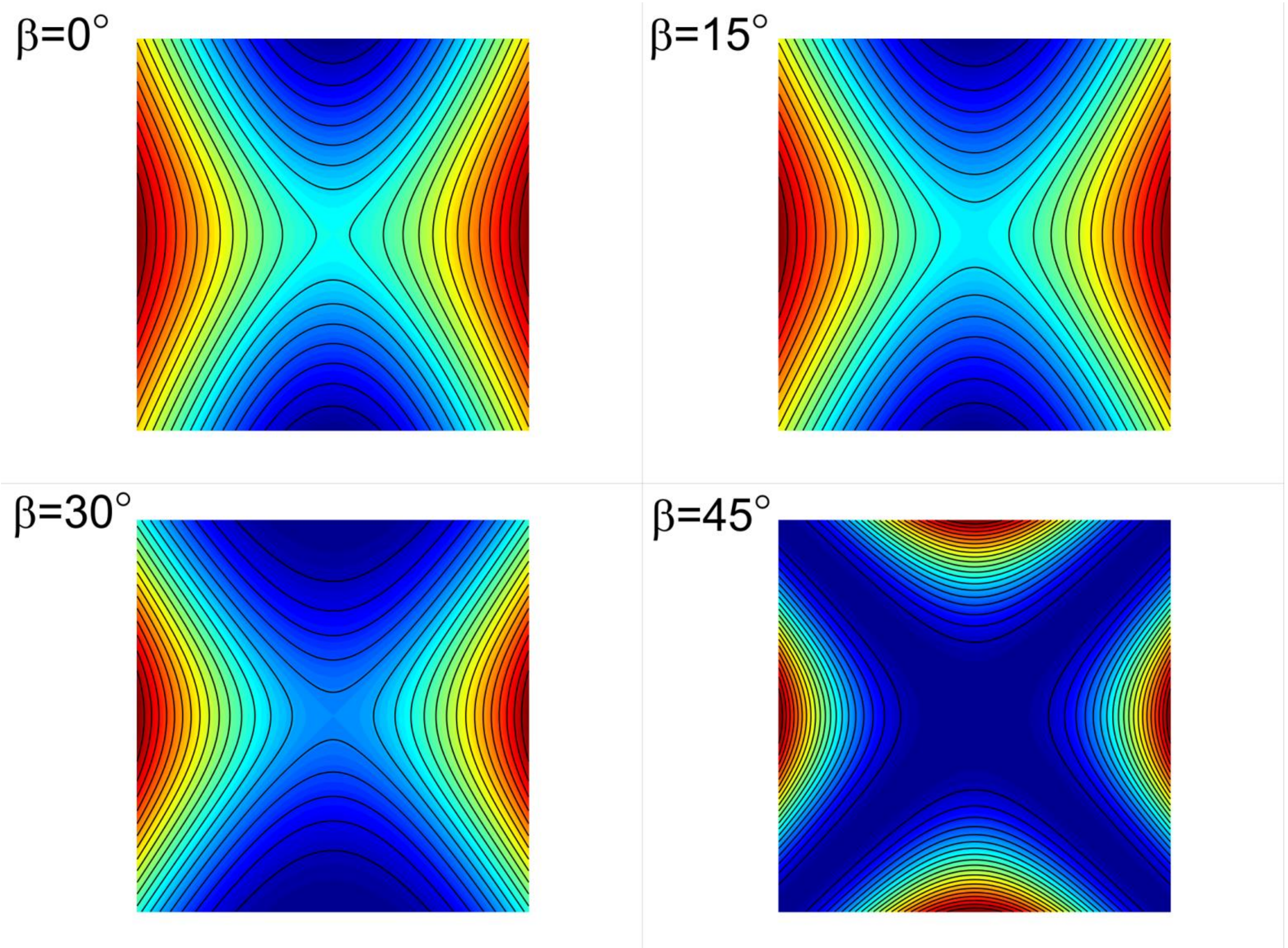
Rozkłady izochrom

$$Z = 1$$



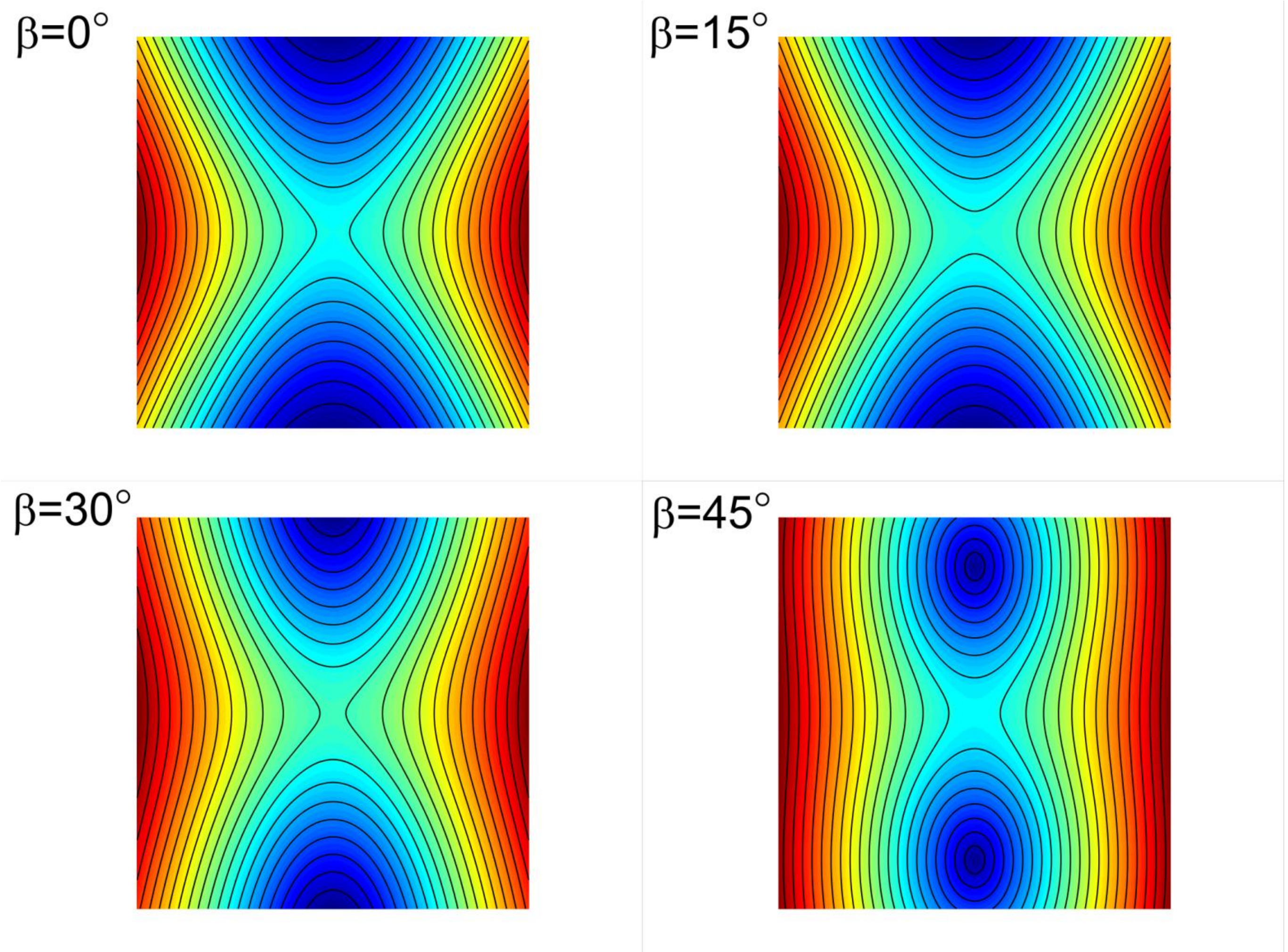
Rozkłady izochrom

$$Y = 1$$

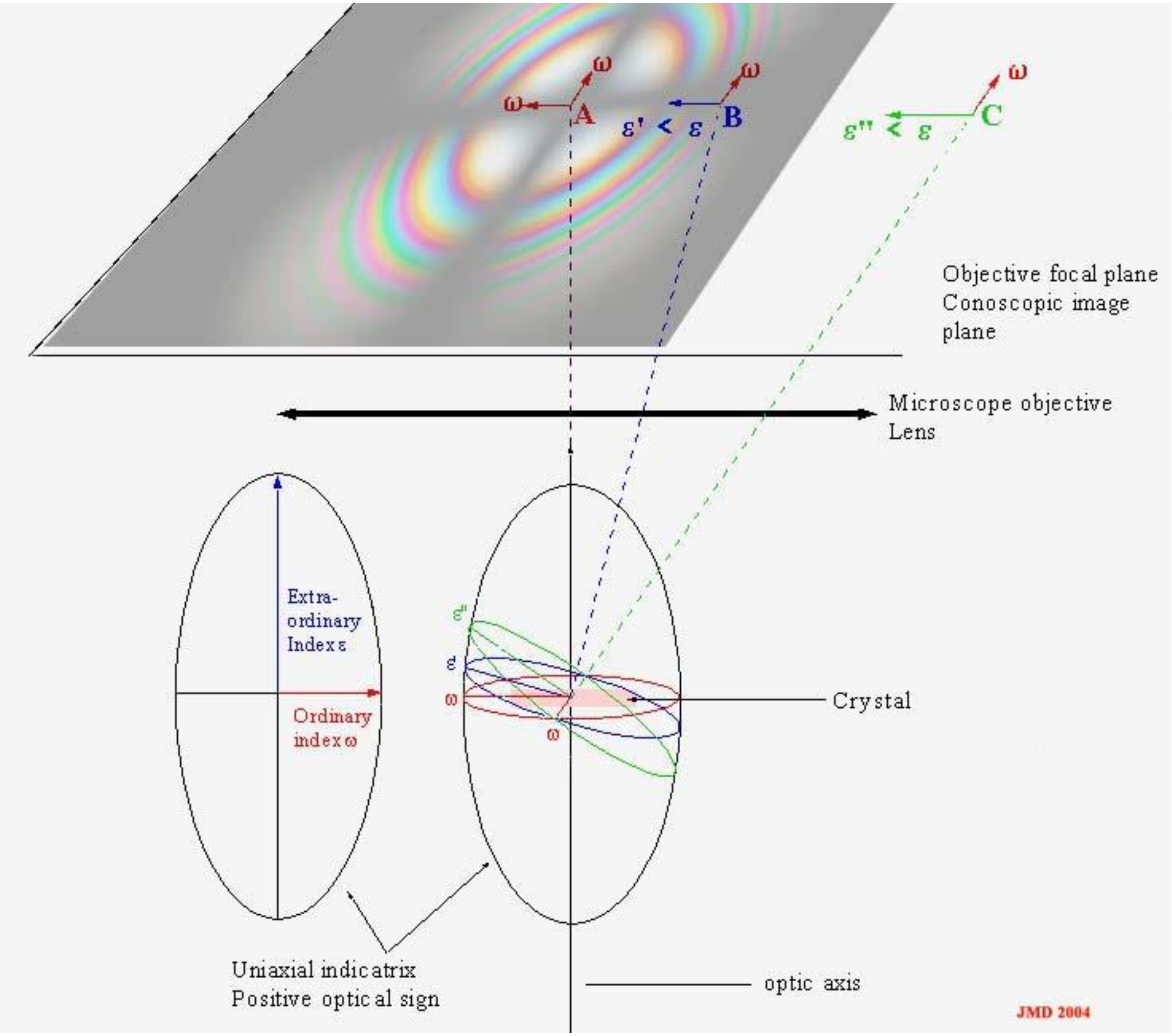


Rozkłady izochrom

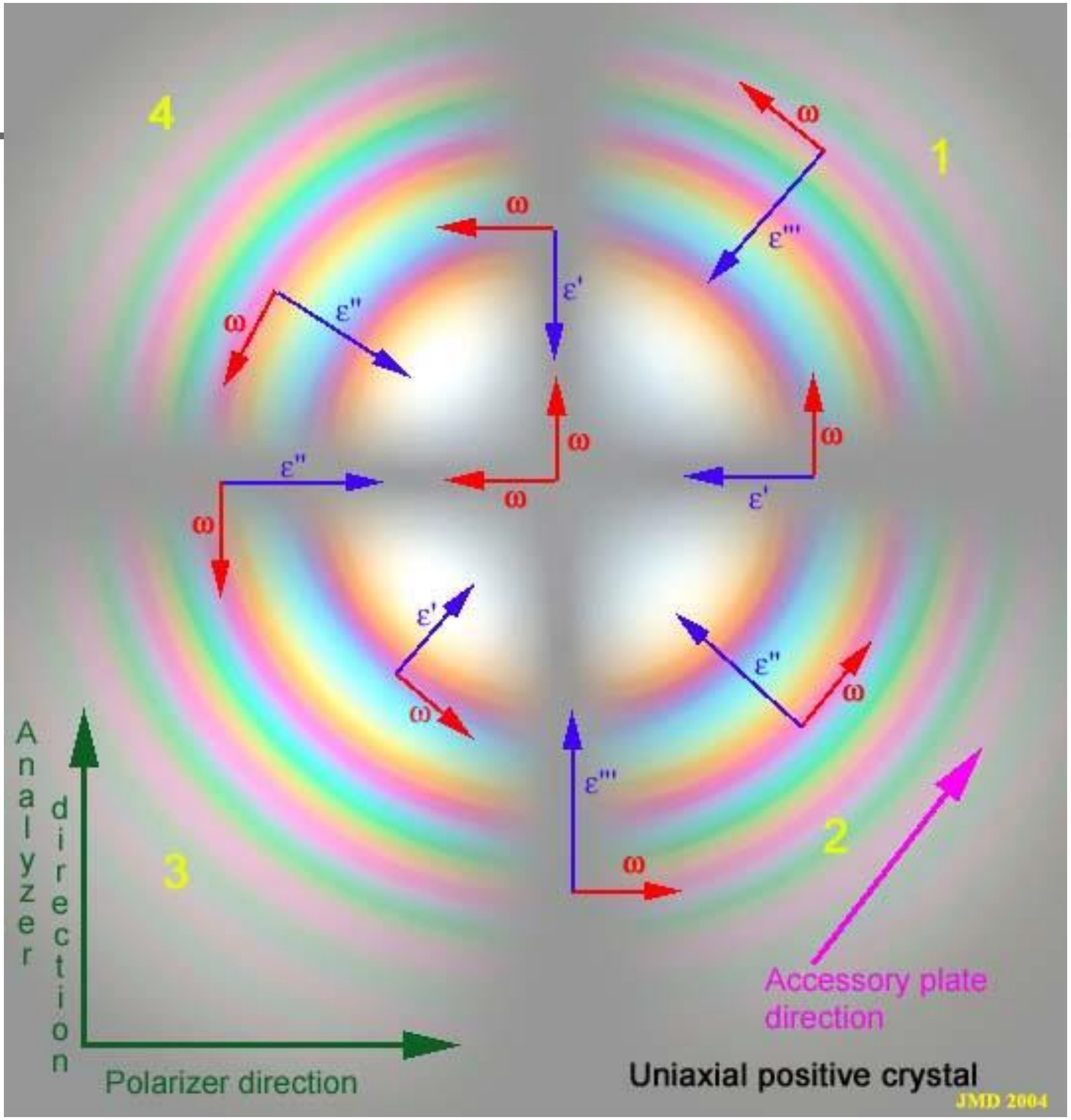
$$X = 1$$



Kryształy jednoosiowe

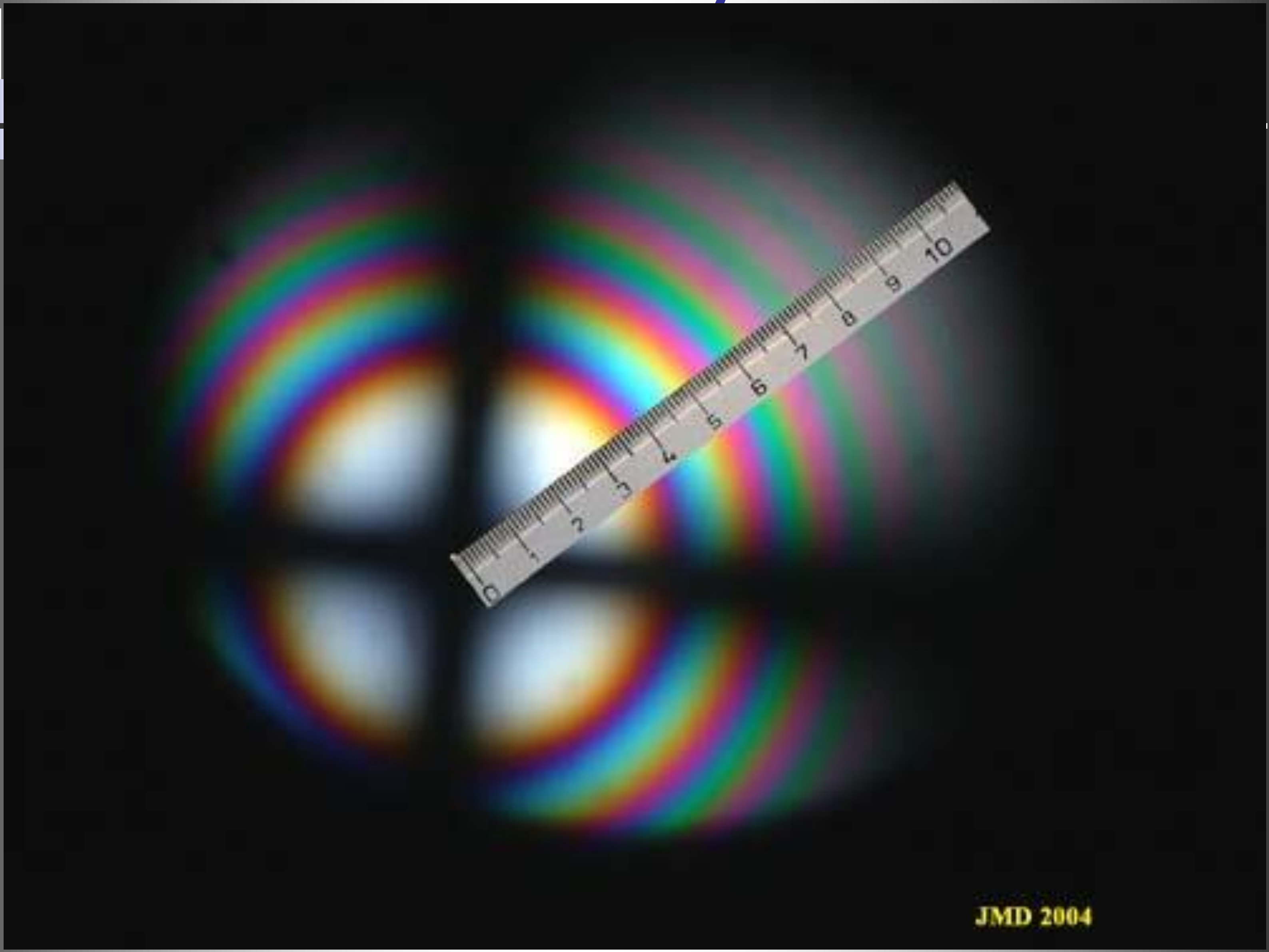


Kryształy jednoosiowe

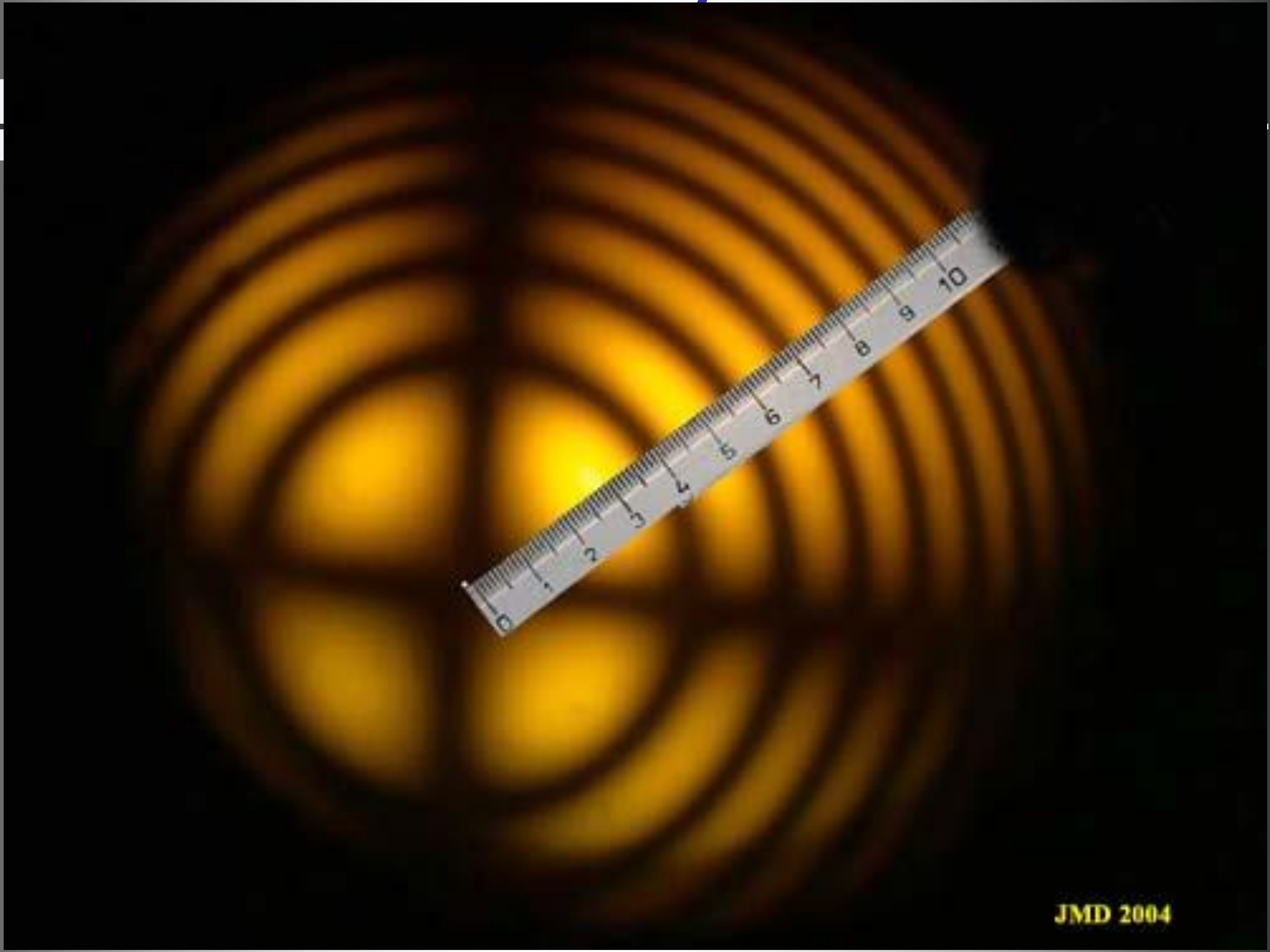


Kalcyt

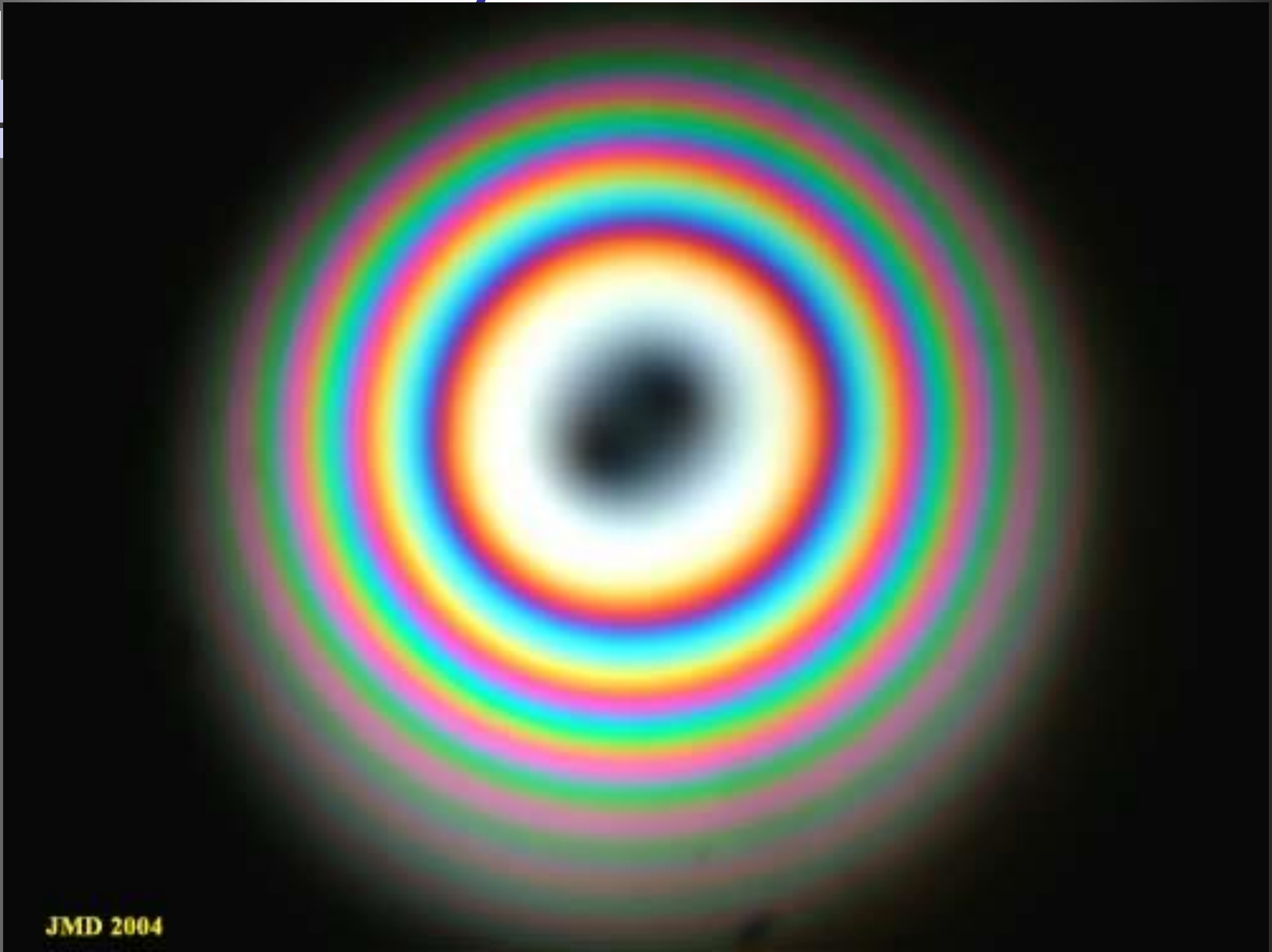
Kalcyt



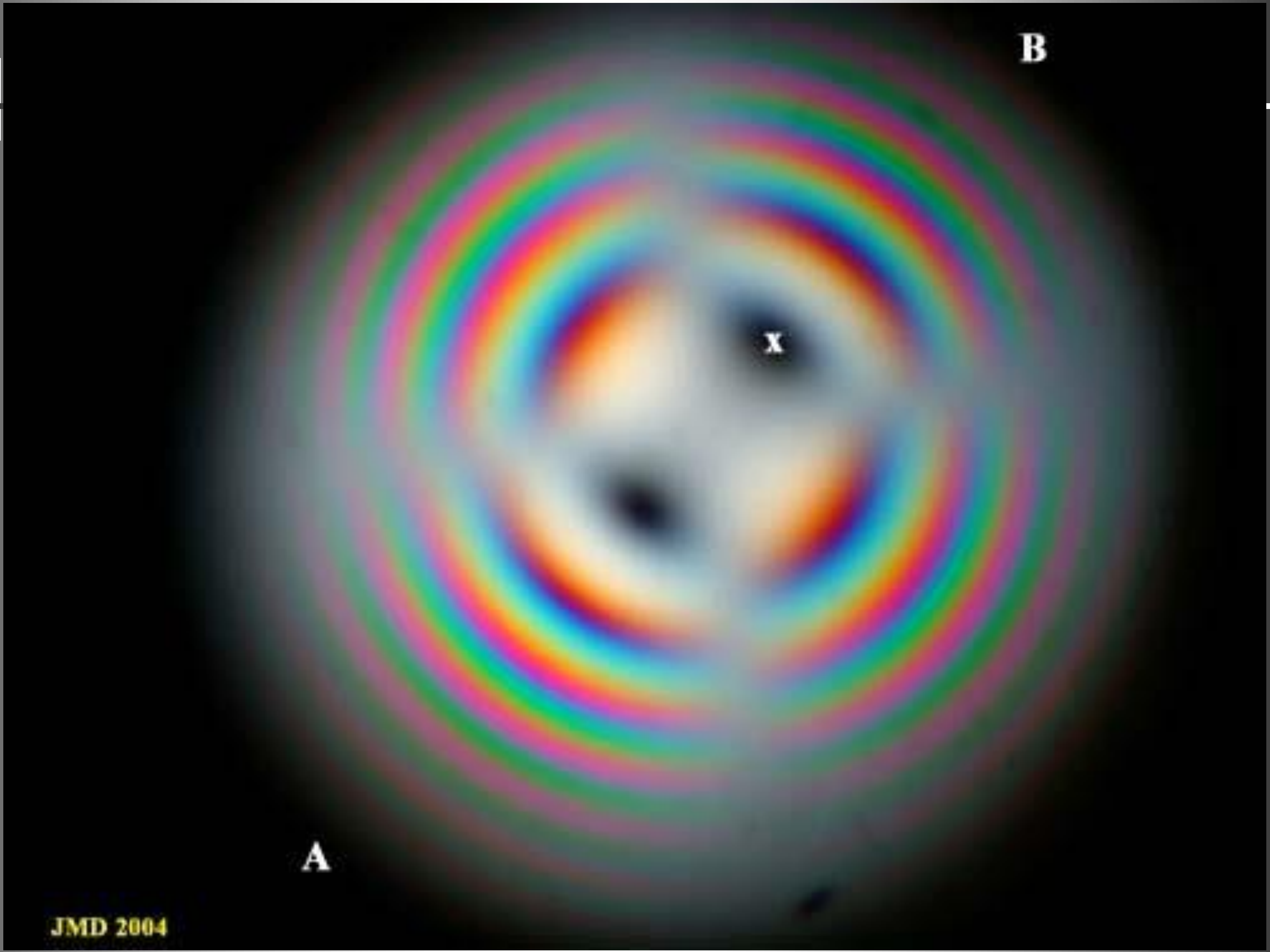
Kalcyt



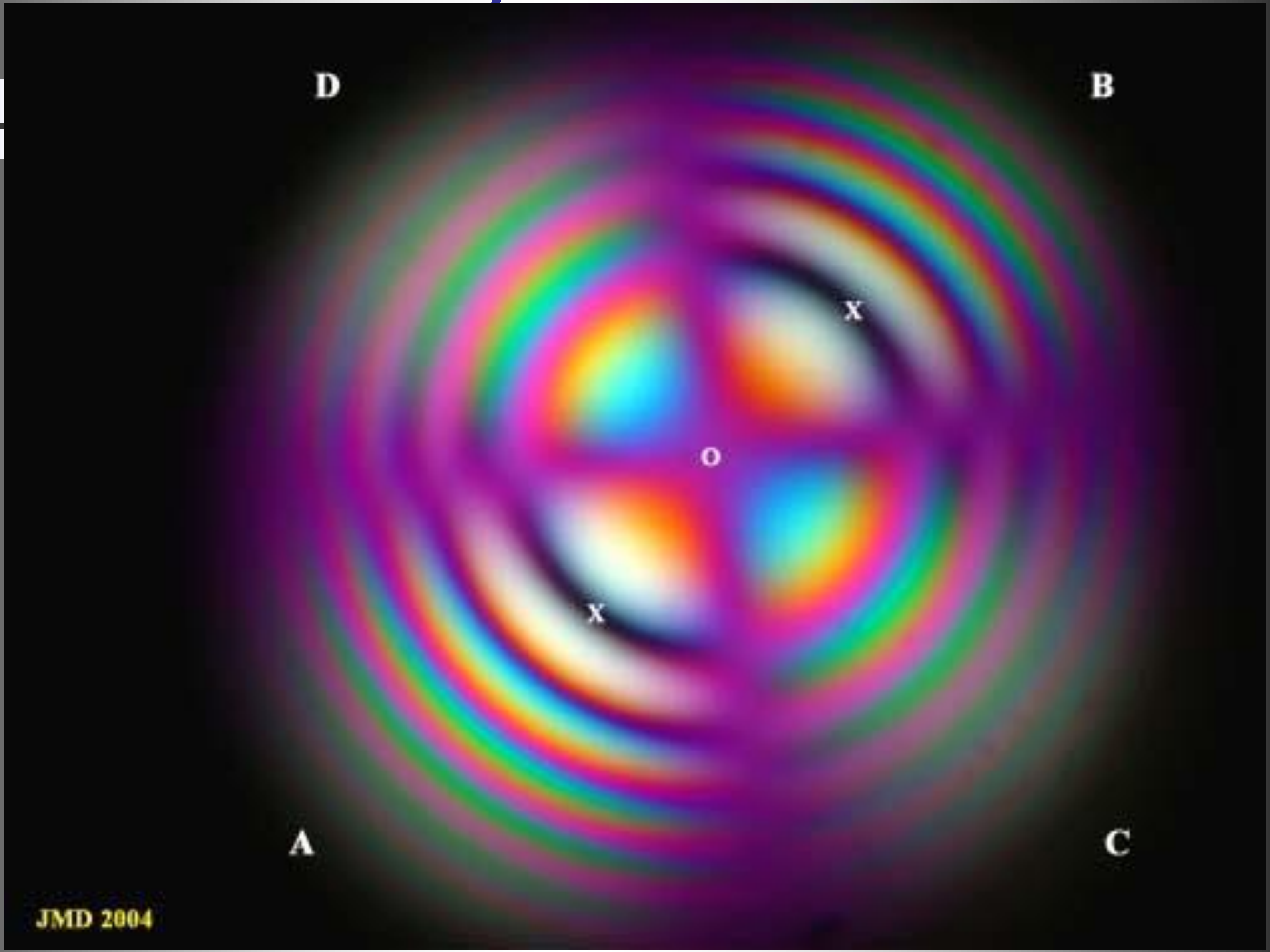
Kalcyt i Benford



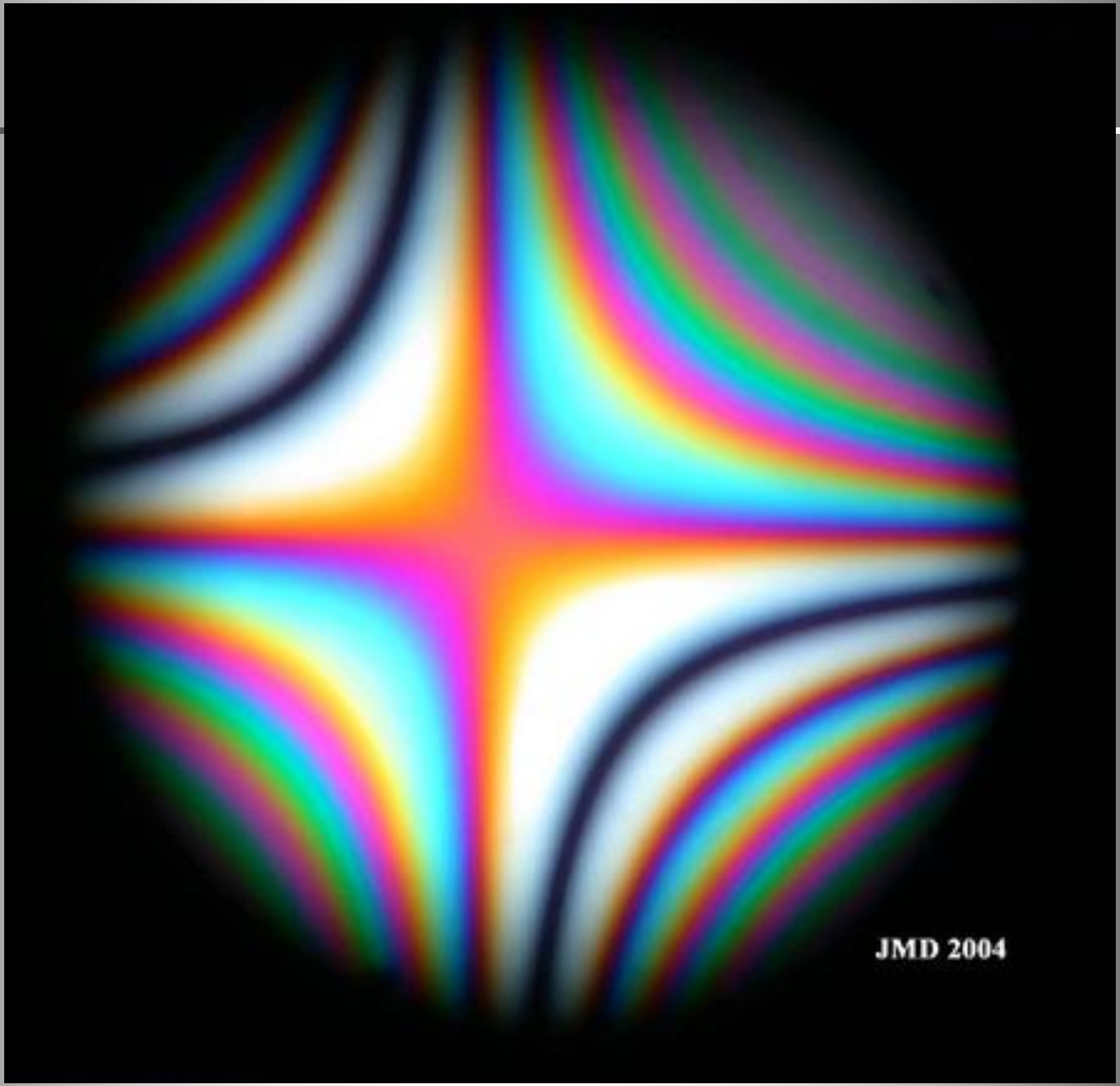
Kalcyt i ćwierćfalówka



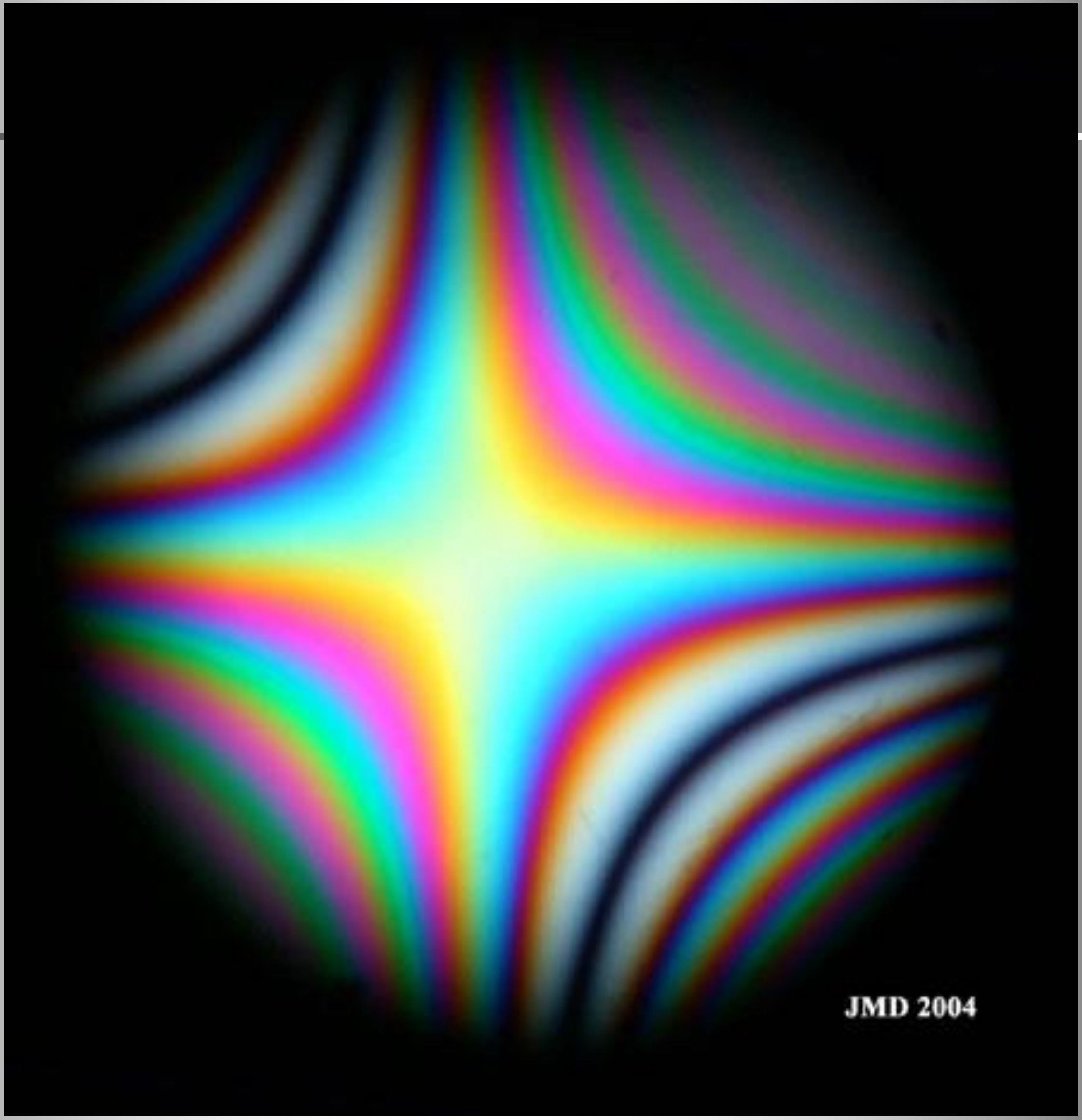
Kalcyt i falówka



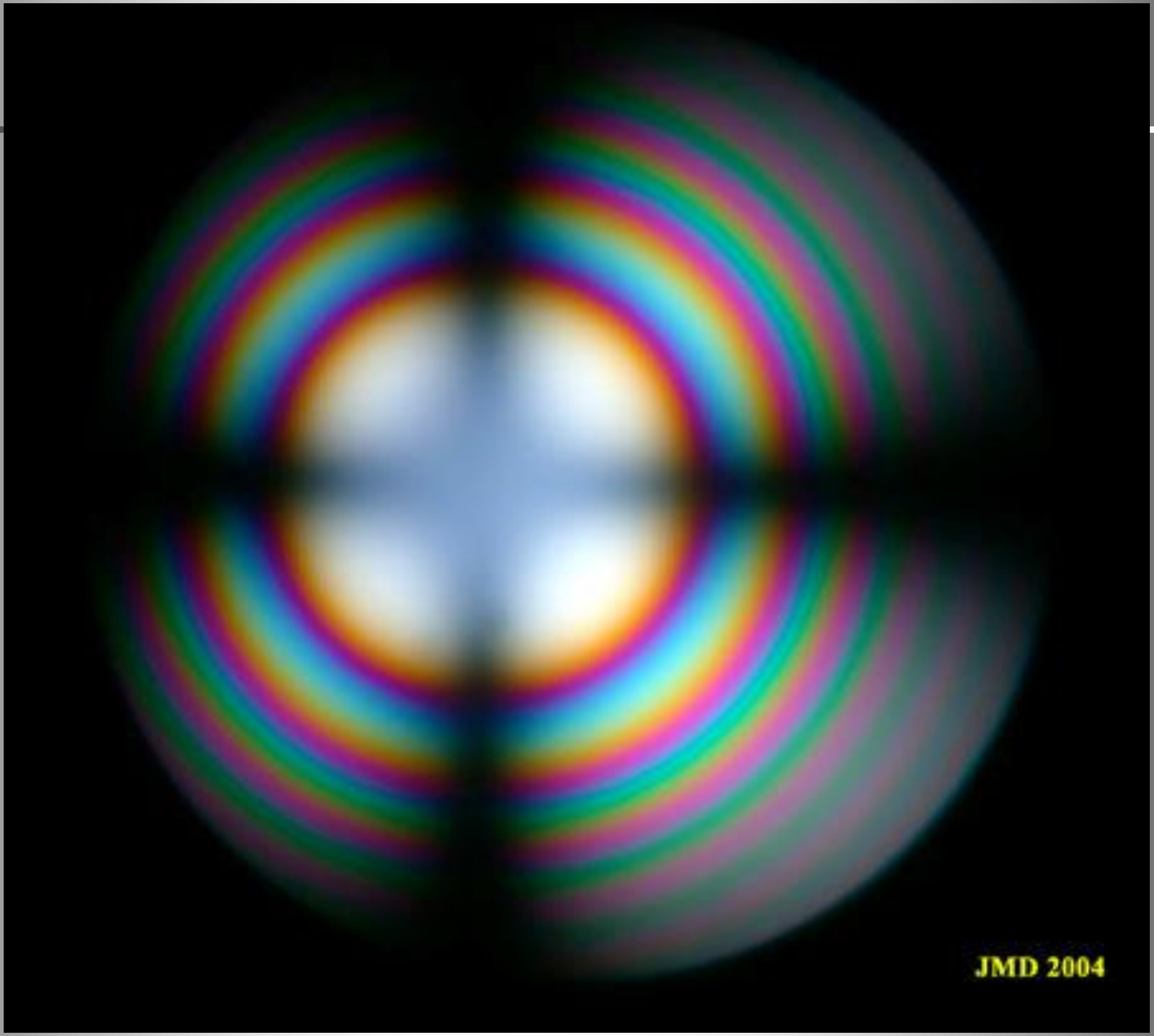
Kwarc „normalny”



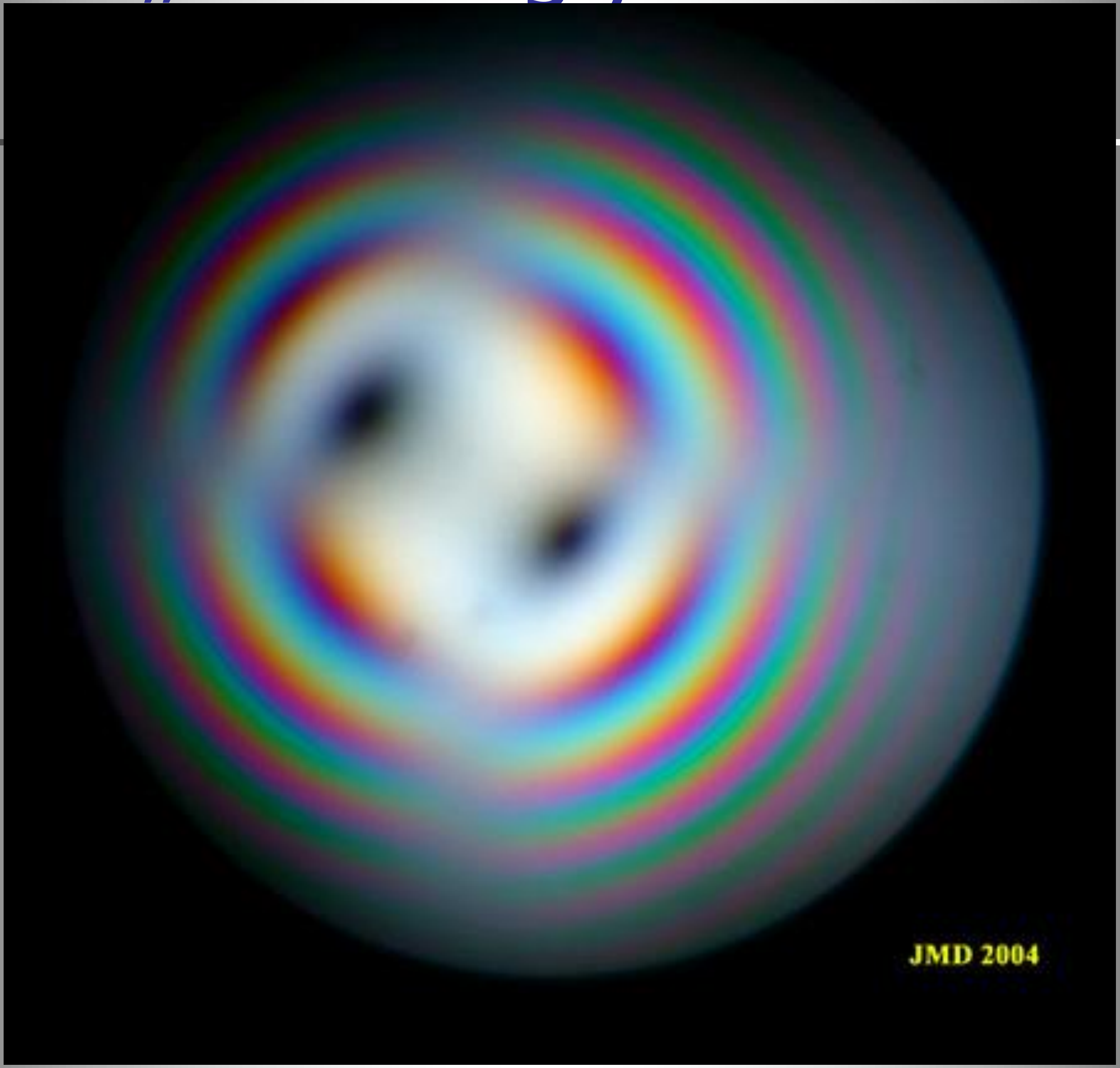
Kwarc „normalny”



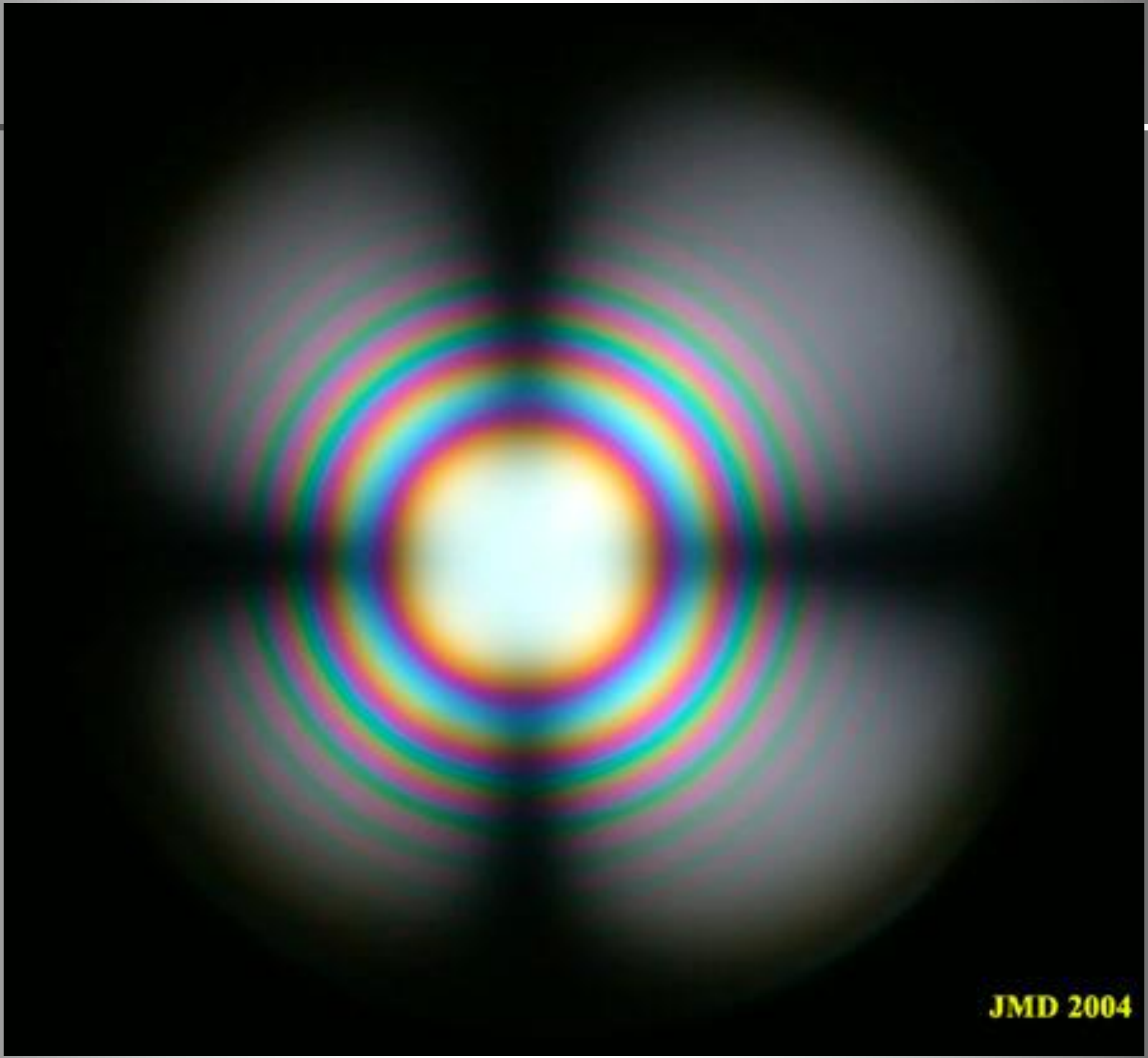
Kwarc „równoległy”



Kwarc „równoległy” i ćwierćfalówka

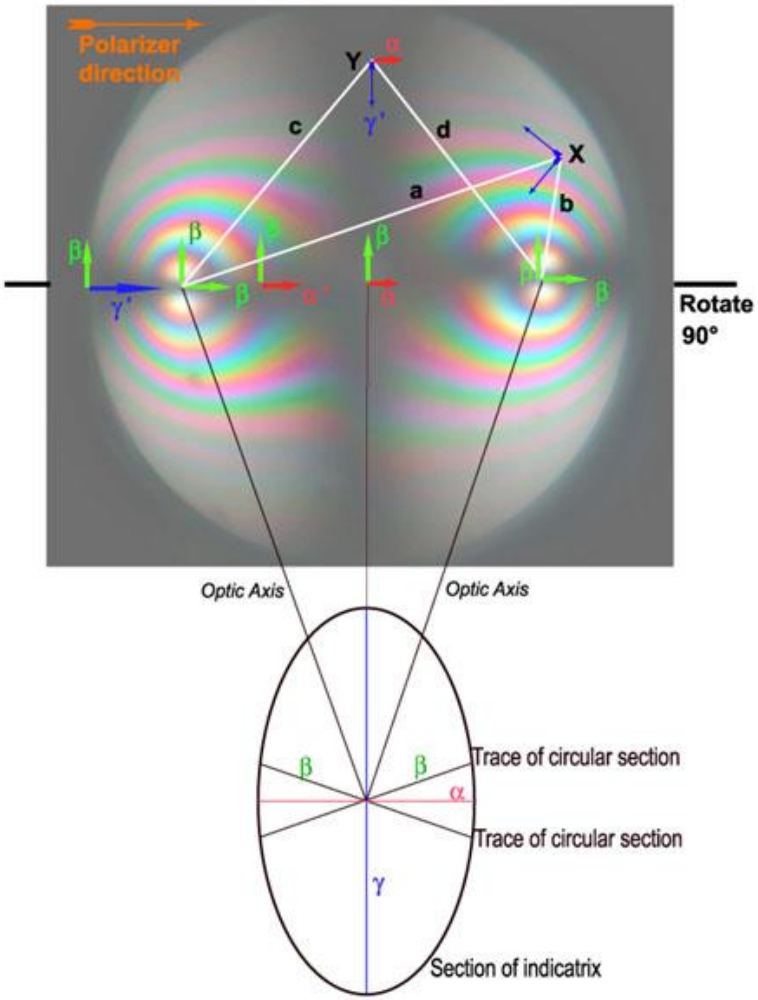


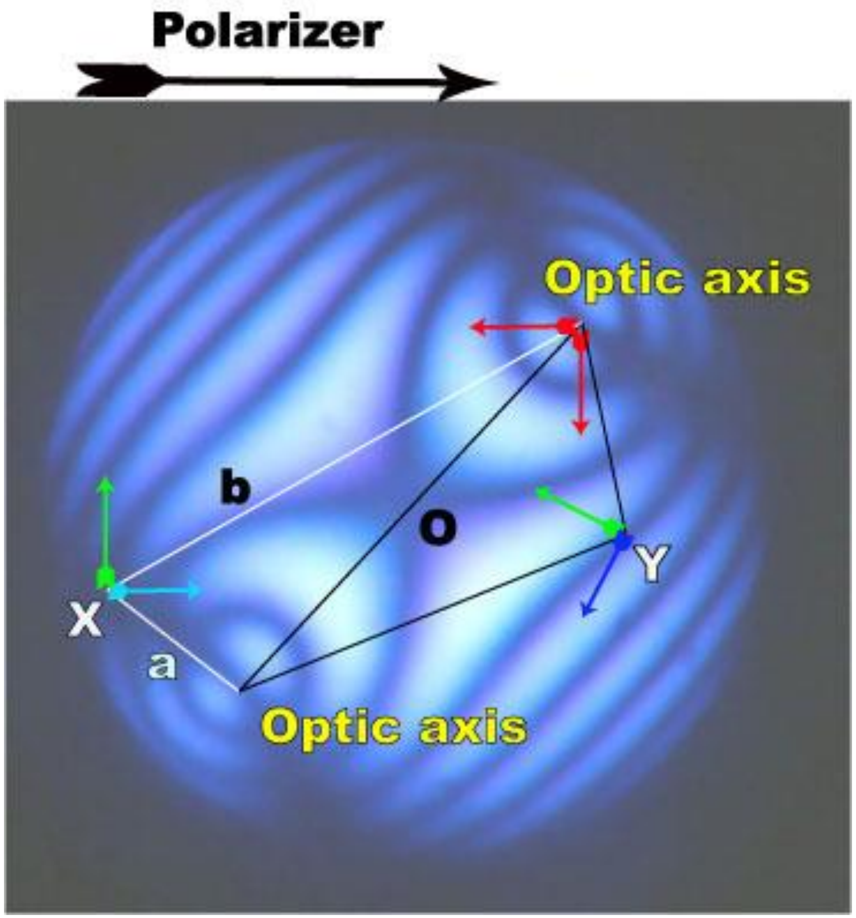
Kwarc „równoległy”



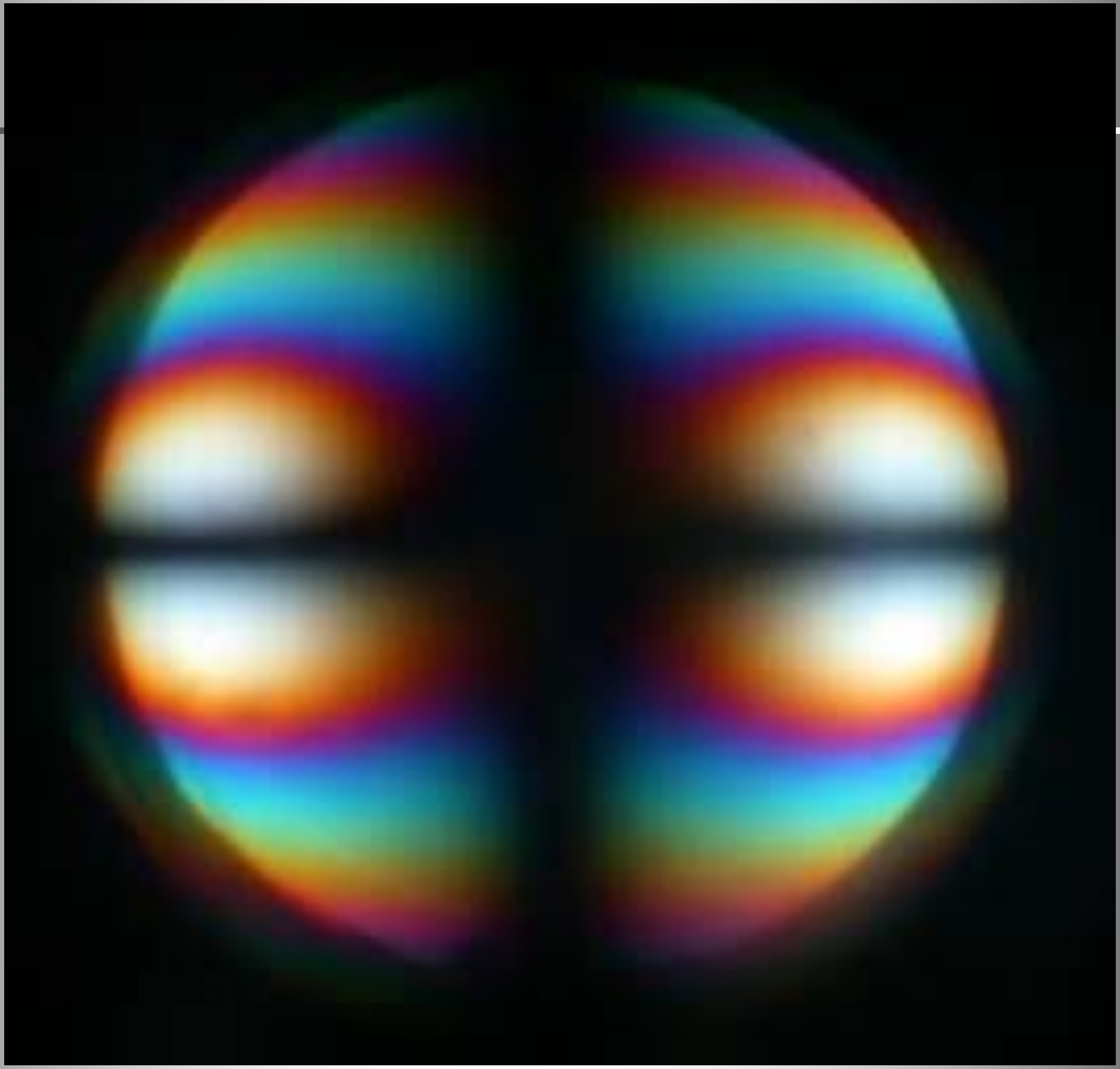
Kwarc „równoległy” i ćwierćfalówka

Kryształy dwuosiowe

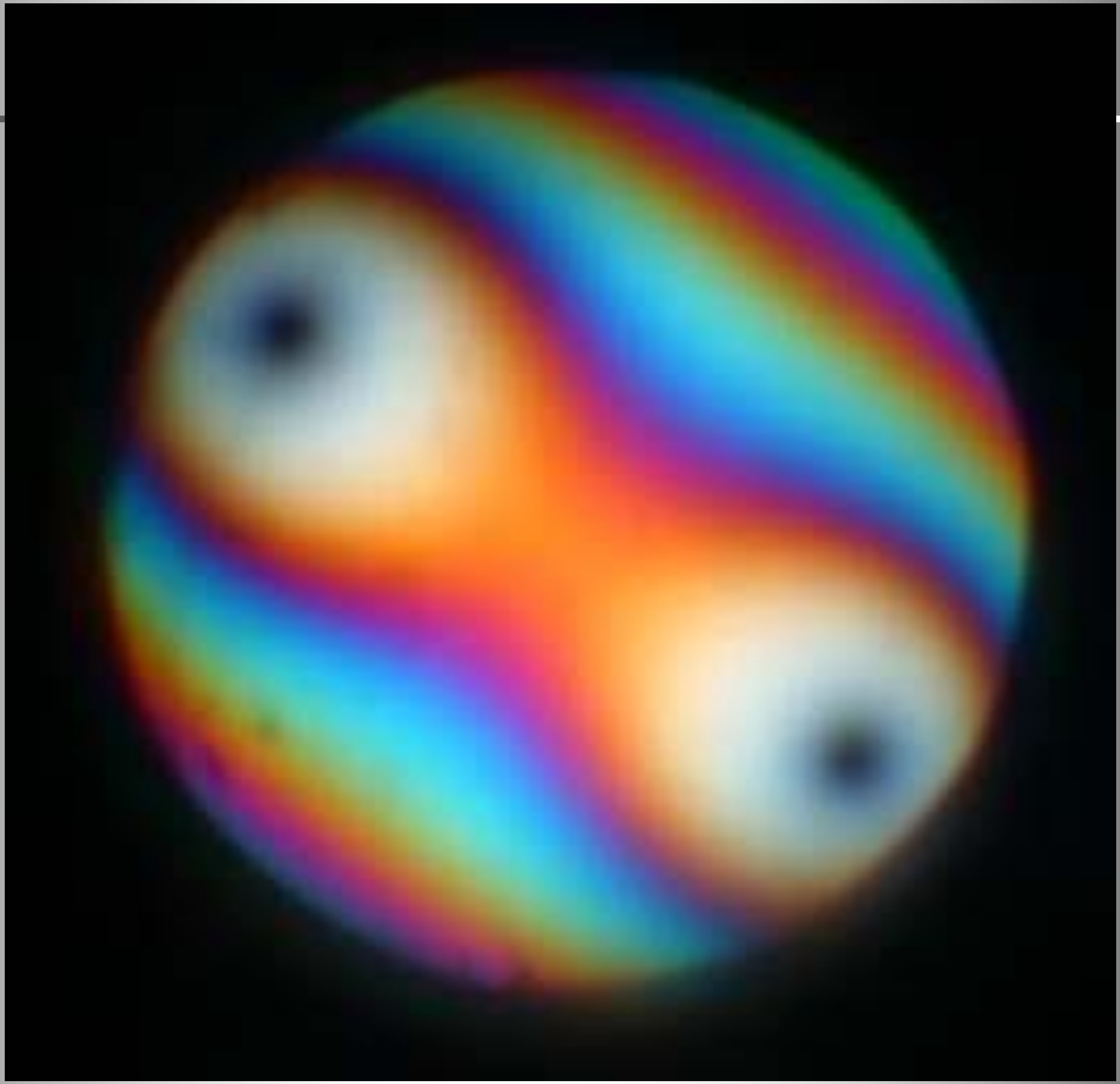




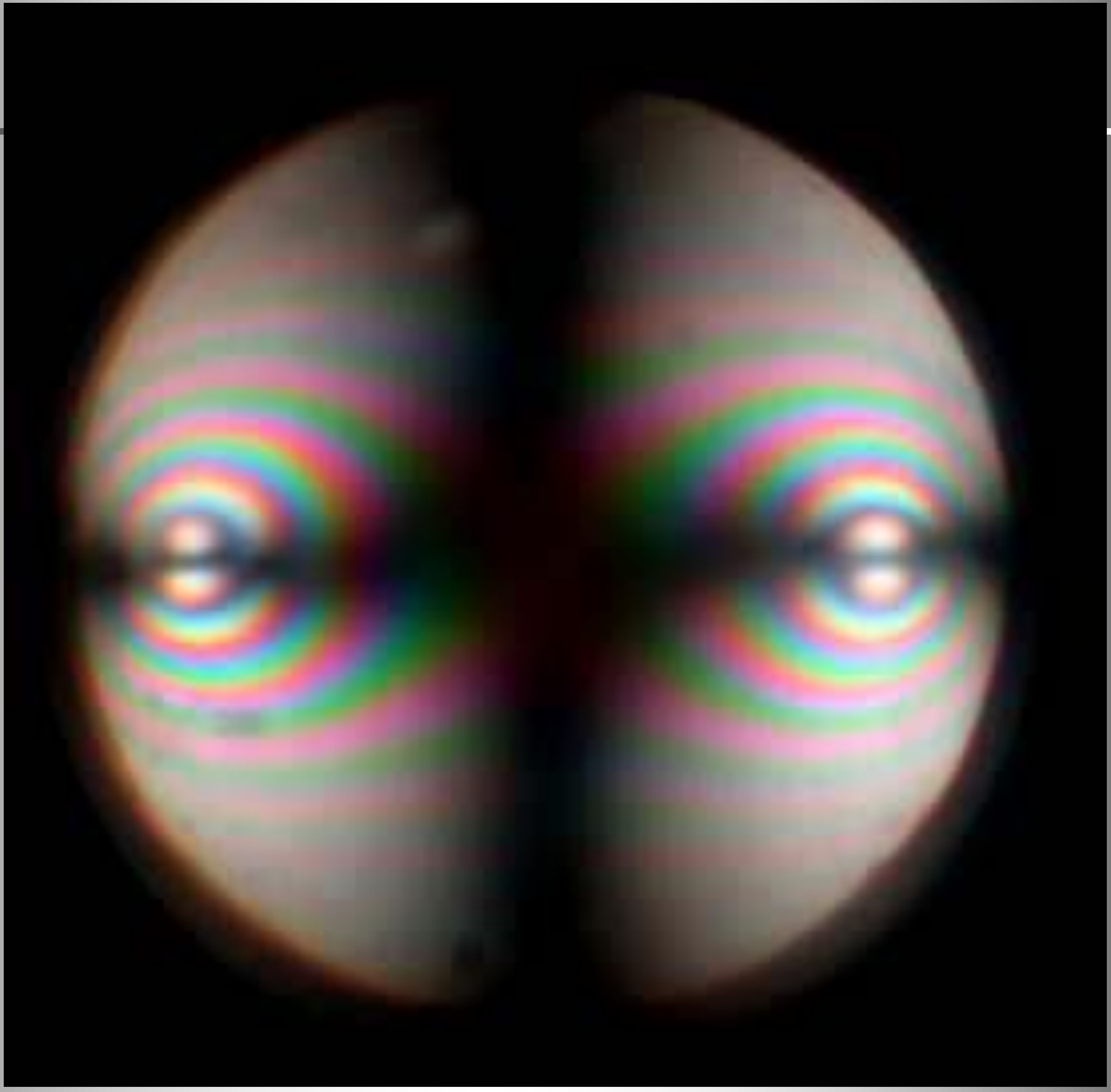
Muskowit



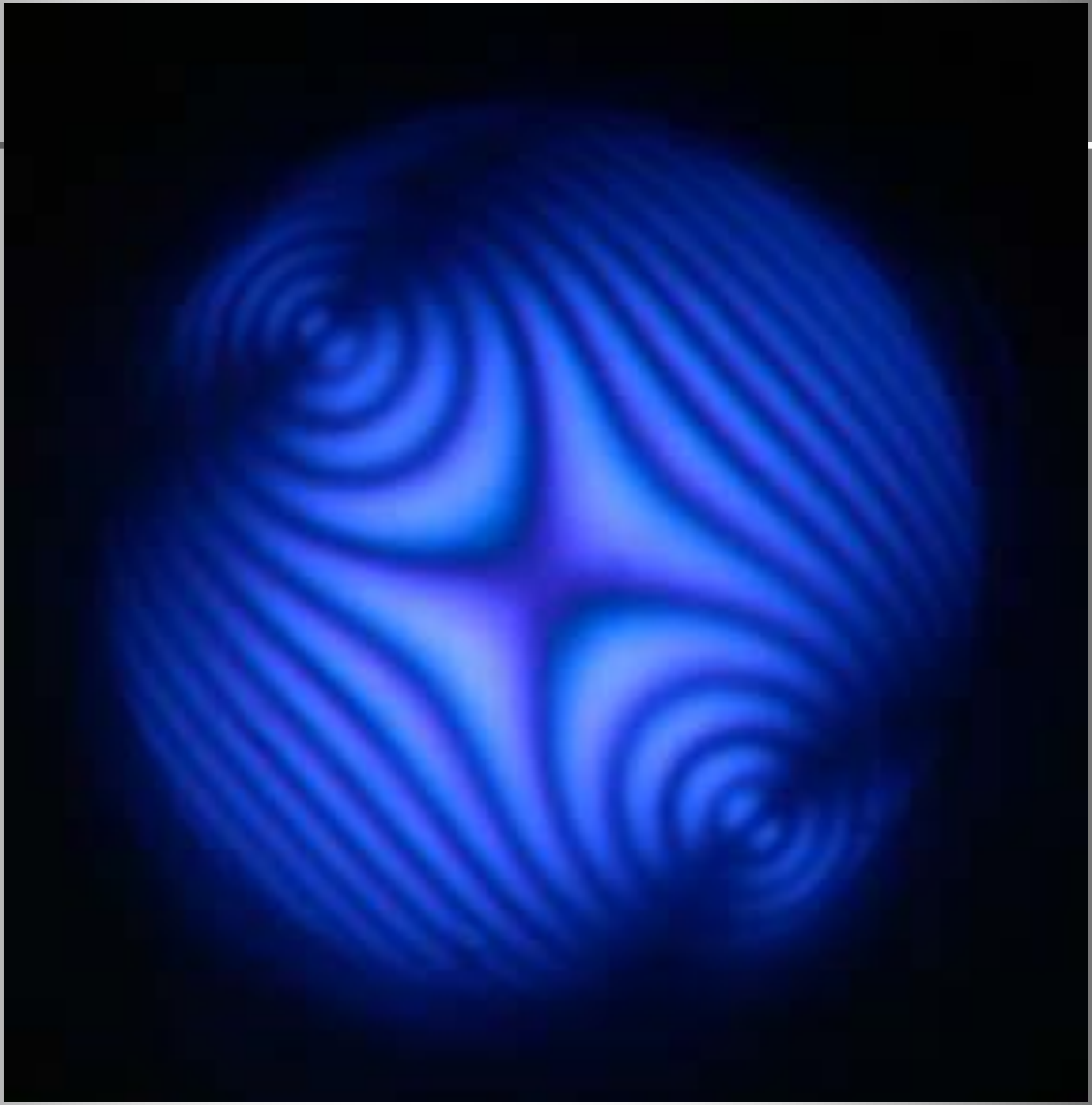
Muskowit i Benford



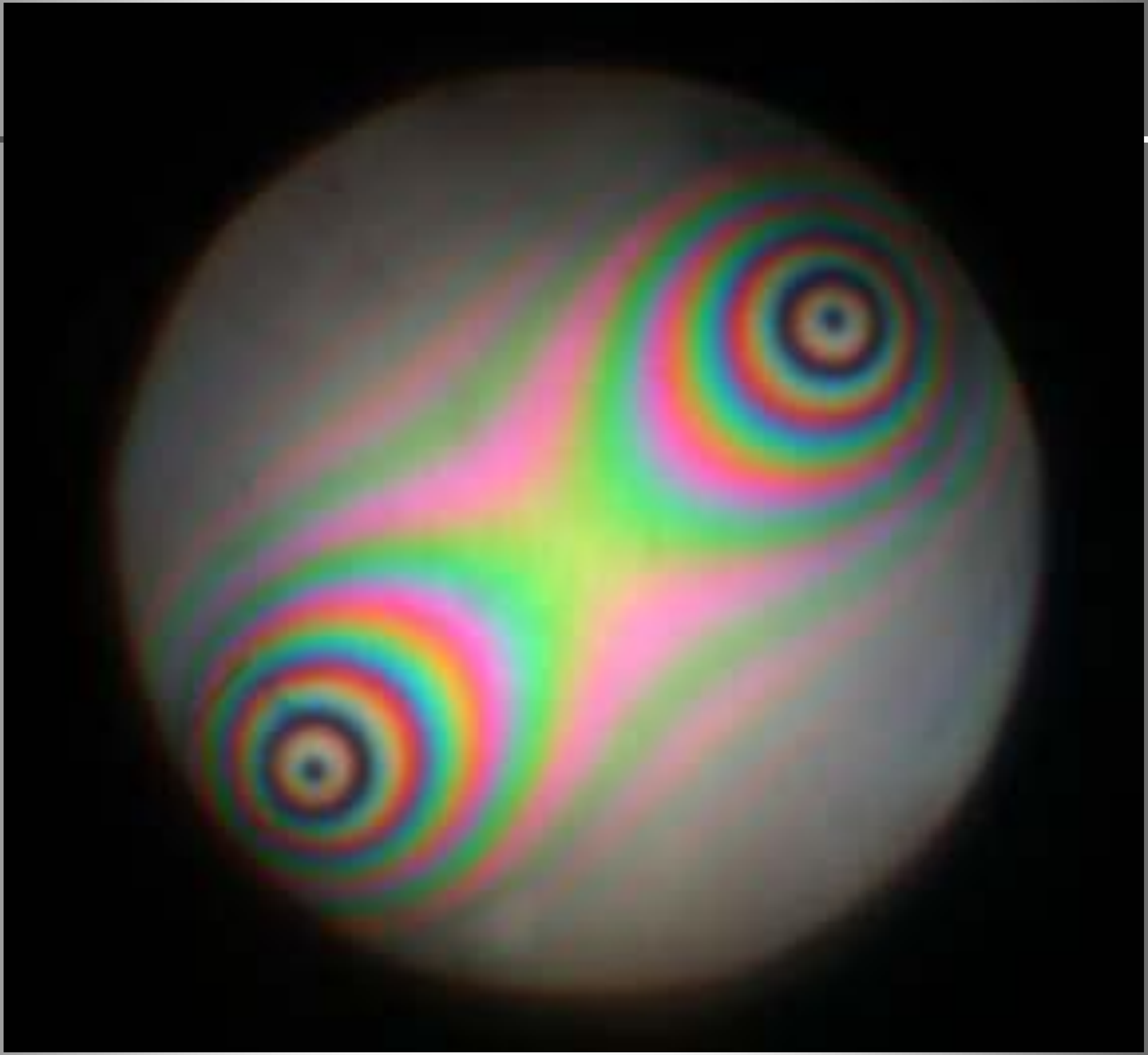
Muskowit



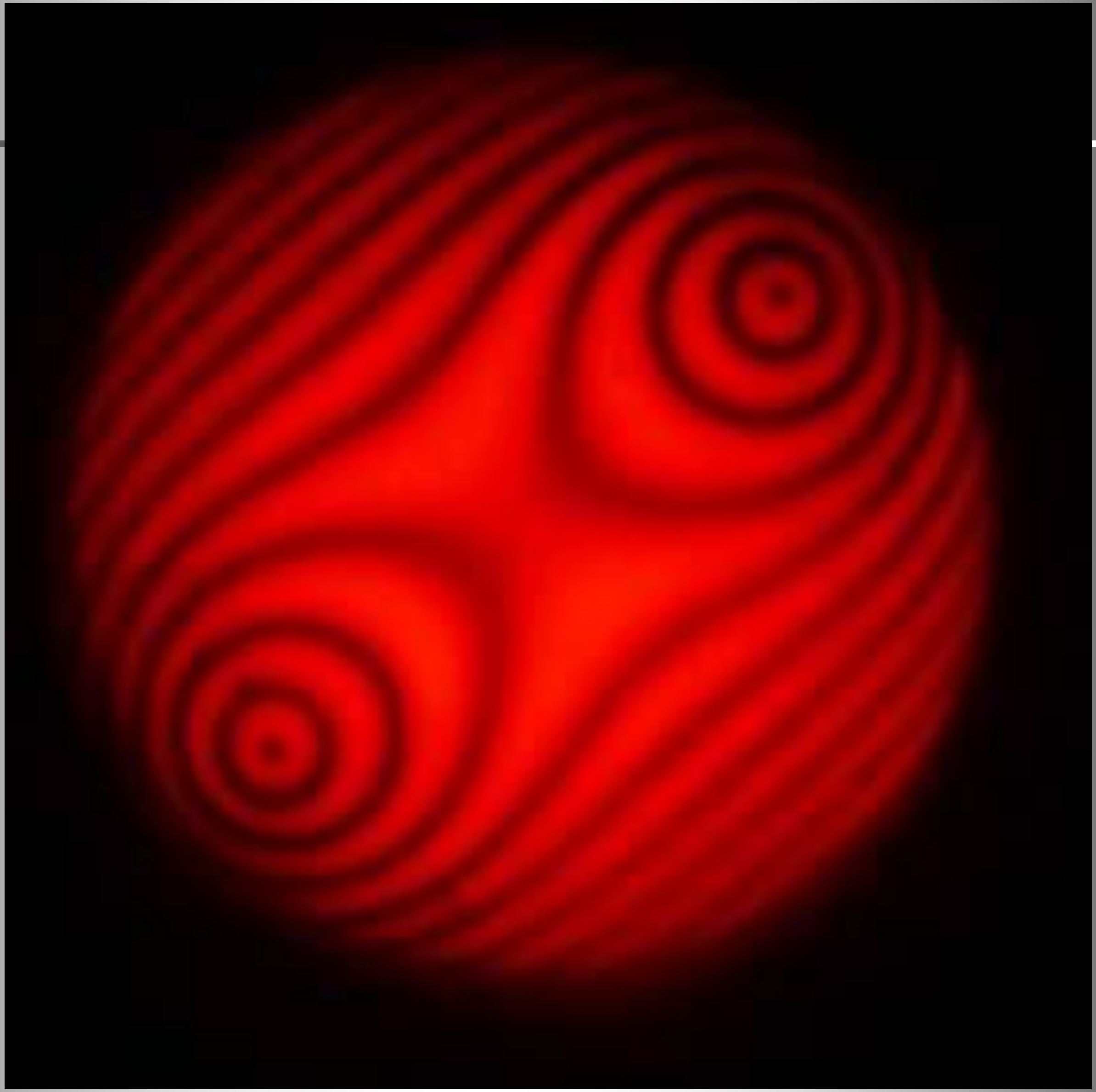
Muskowit



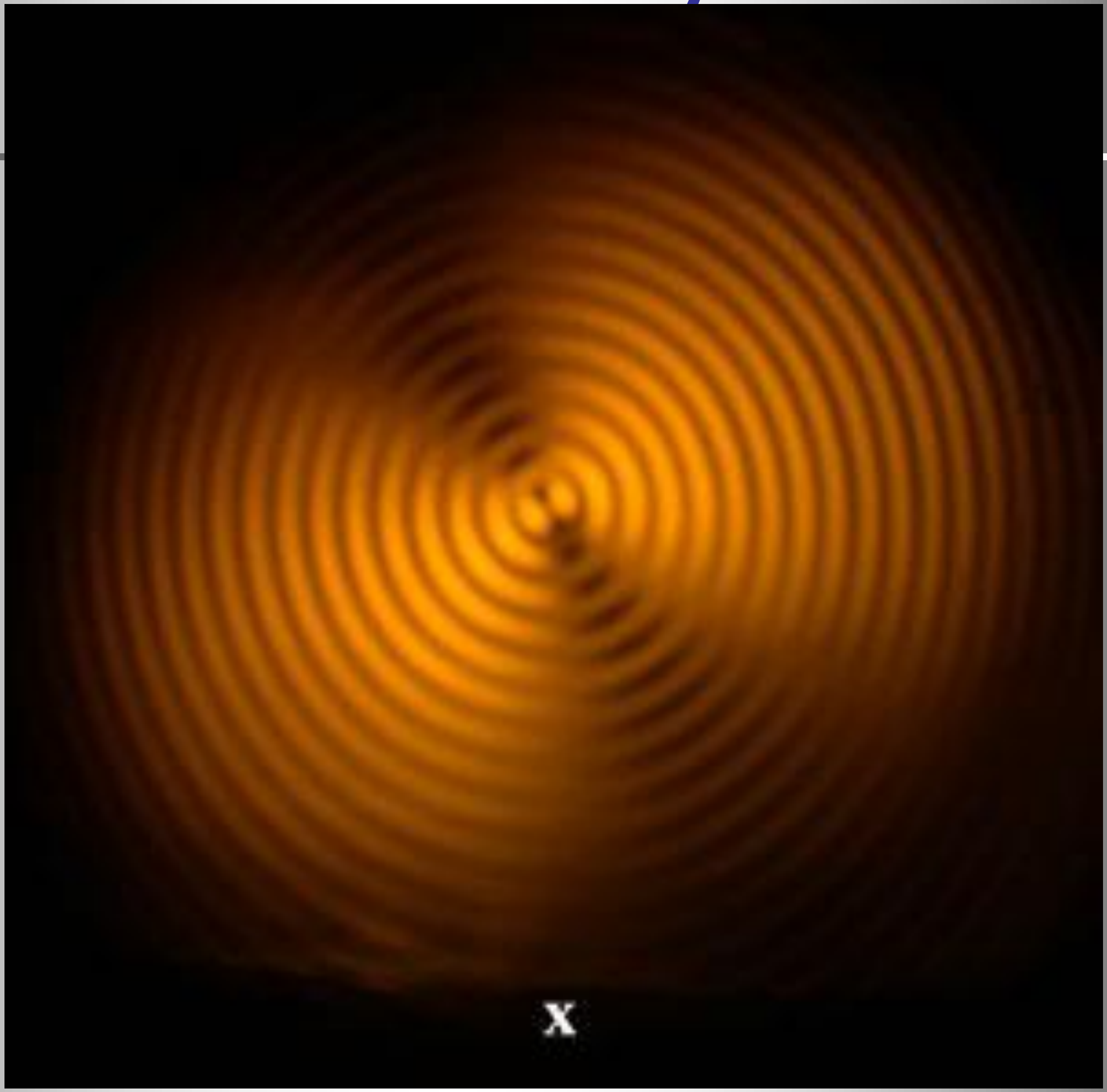
Muskowit i Benford



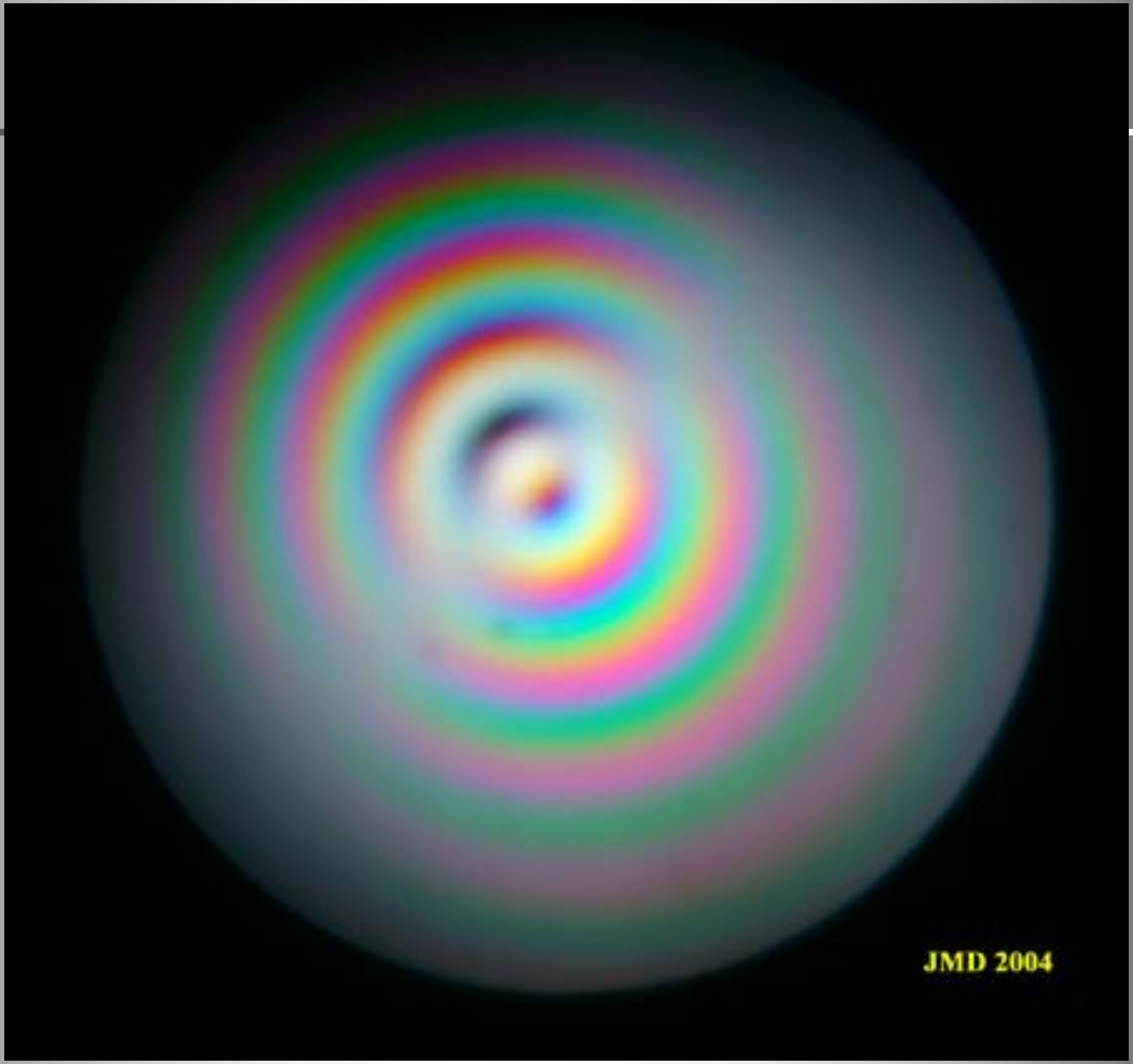
Muskowit i Benford



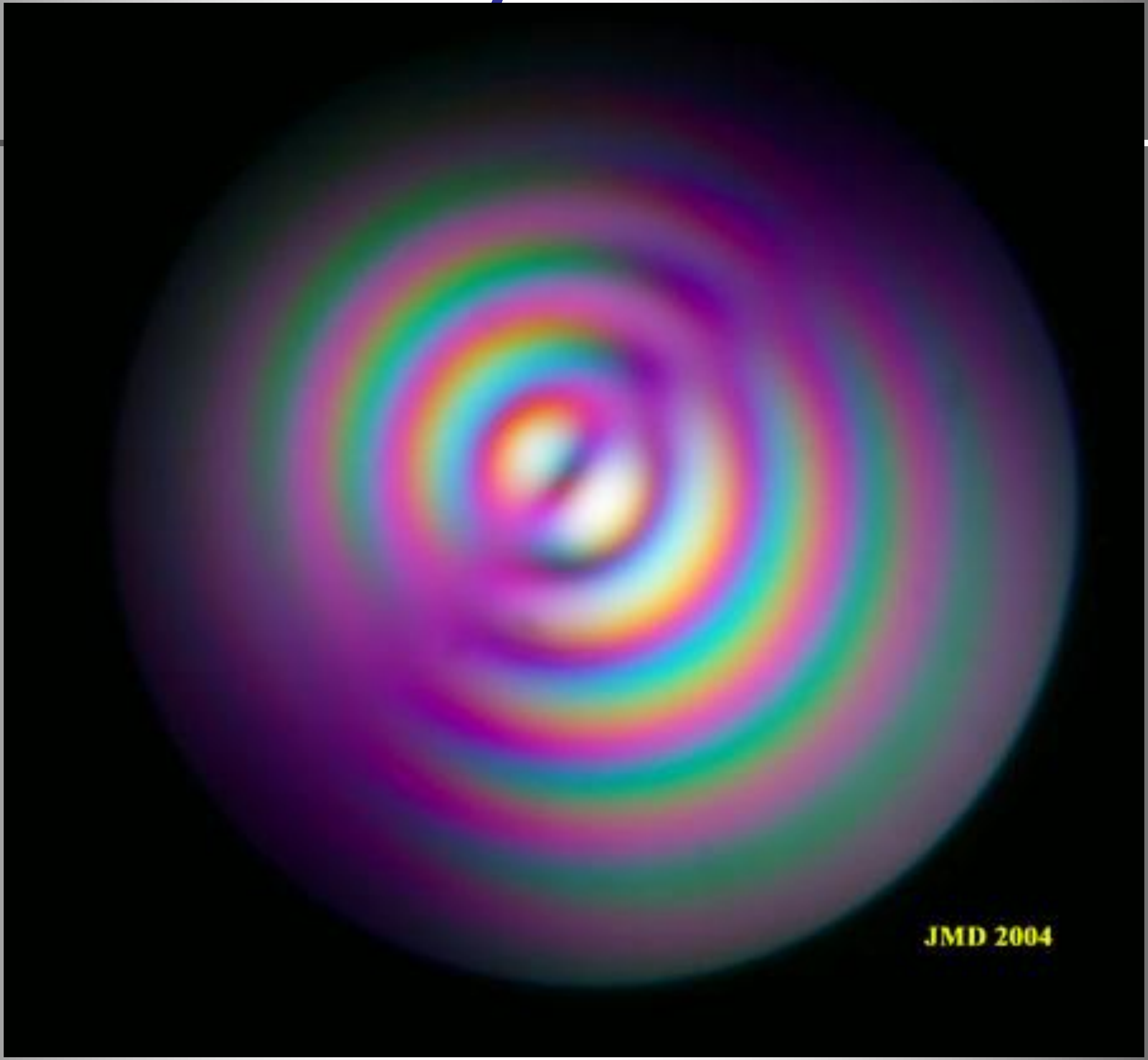
Danburyt



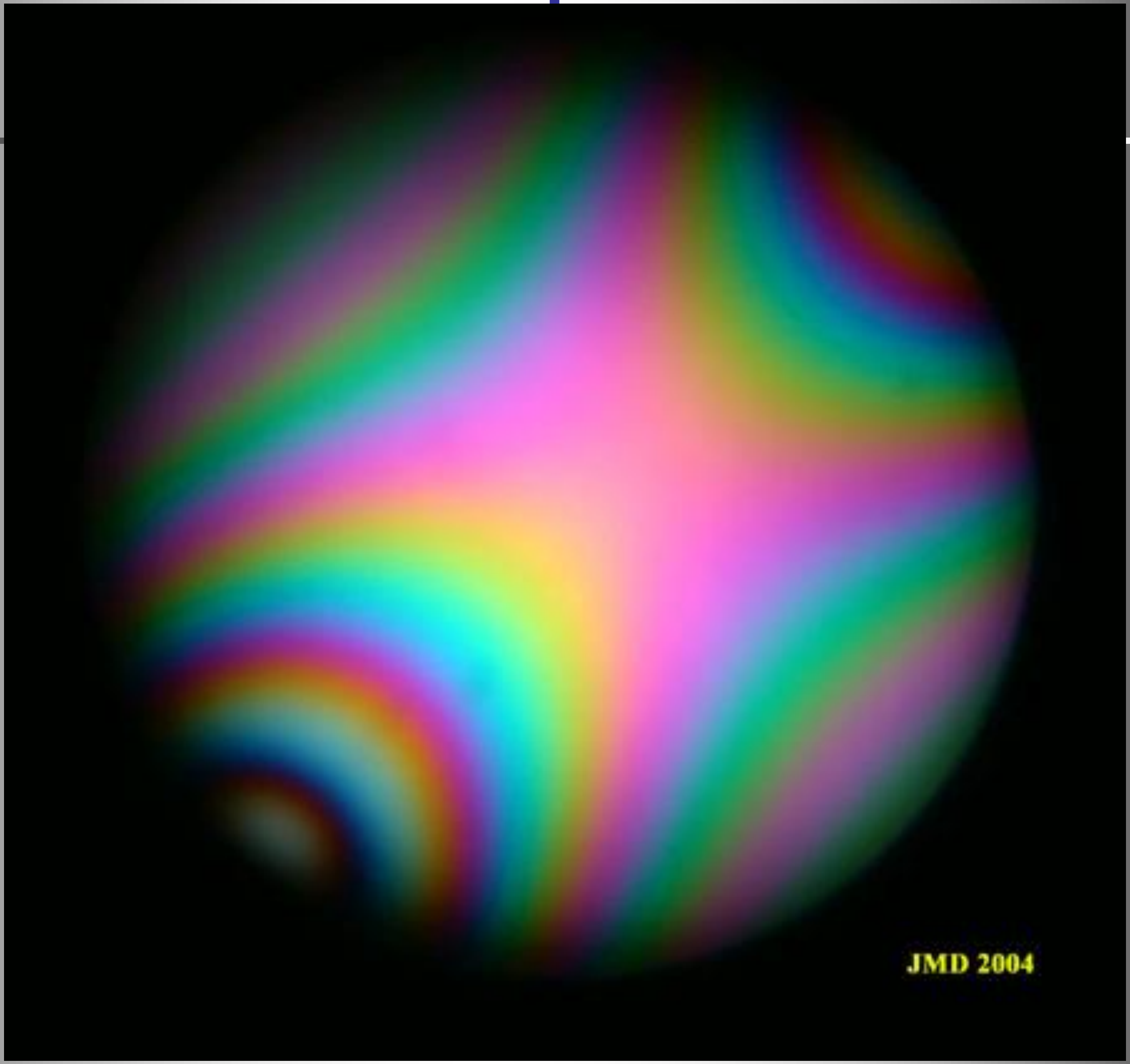
Danburyt i ćwierćfalówka



Danburyt i falówka



Topaz



Topaz