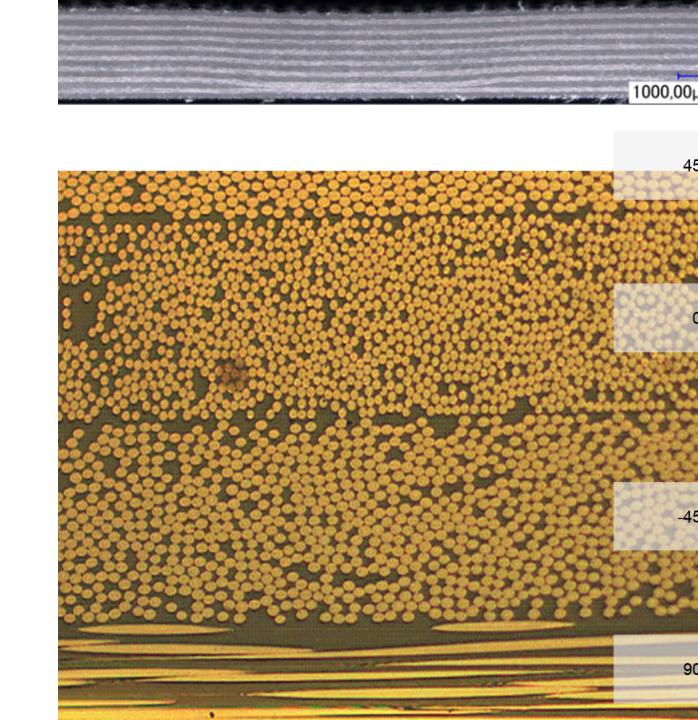
## Leichtbau

Prof. Dr.-Ing. Christian Willberg Magdeburg-Stendal University of Applied Sciences

Contact: christian.willberg@h2.de





$$\rightarrow$$
:  $F_1 \cos \alpha + F_2 + F_3 \cos \beta = 0$ 

$$\uparrow$$
:  $F_1 \sin \alpha - F_e - F_3 \sin \beta = 0$ 

$$\sigma_i = rac{F_i}{A_i} = E_i arepsilon = E_i rac{\delta u_i}{l_i} \ F_i = E_i A_i rac{\delta u_i}{l_i}$$

## Energie

$$W_i = E_i A_i rac{\delta u_i}{l_i} \delta u_i$$

$$F_e\delta u_y = F_1\delta u_1 + F_2\delta u_2 + F_3\delta u_3 \ \delta u_y = \sinlpha\delta u_1 = \sineta\delta u_3$$

$$F_e \delta u_y = F_1 rac{\delta u_y}{\sinlpha} + F_2 \delta u_2 + F_3 rac{\delta u_y}{\sineta}$$



$$\mathsf{aus} \to$$

$$egin{aligned} E_2A_2rac{\delta u_x}{l_2} &= E_1A_1rac{\delta u_1}{l_1}\coslpha + E_3A_3rac{\delta u_3}{l_3}\coseta \ E_2A_2rac{\delta u_x}{l_2} &= E_1A_1rac{1}{l_1}\coslpharac{\delta u_y}{\sinlpha} + E_3A_3rac{1}{l_3}\cosetarac{\delta u_y}{\sineta} \ \delta u_x^2 &= \left[l_2rac{E_1A_1rac{\coslpha}{l_1\sinlpha} + E_3A_3rac{\coseta}{l_3\sineta}}{E_2A_2}
ight]^2\delta u_y^2 = A\delta u_y^2 \ F_e\delta u_y &= \left(rac{E_1A_1}{l_1\sinlpha^2} + rac{E_3A_3}{l_3\coseta^2}
ight)\delta u_y^2 + rac{E_2A_2}{l_2}A\delta u_y^2 \end{aligned}$$

nach  $\delta u_y$  auflösen und dann den Rest bestimmen.