

### 5.3.4 Summary to: Optical Components

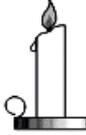
#### Light Sources

Hot bodies (tungsten filaments) in light bulbs and plasma discharge in fluorescent tubes

- Inefficient light bulbs still dominates when this lecture course started (2010)
- LEDs have taken over when this hyperscript was finalized (2019)

Not included above is the **Laser**.

- You must learn about the Laser somewhere else

15th	19th	20th century...		
				
	GL	FL	HID	LED
Efficiency		lm/W		
1	10 – 15	70 – 104	70 – 100	>> 100
Efficiency		(rel.)		
<1%	5 – 9%	25 – 30%	30 – 35%	30 – 50%

#### Processing light

with, for example, conventional lenses, mirrors and prism, anti-reflection coatings

- Even simple light processors like lenses (and the rest from above) might be extremely complex materials engineering products today. Just look at the picture of a (by now (2019) outdated) lens for microelectronic lithography-

Polarizers, diffraction gratings and filters add another layer of complexity.

- The list goes on, with, e.g. phase shifters and whatever is needed for doing holography or...
- Laser "beam forming", modulation, full-high speed detection, ...

