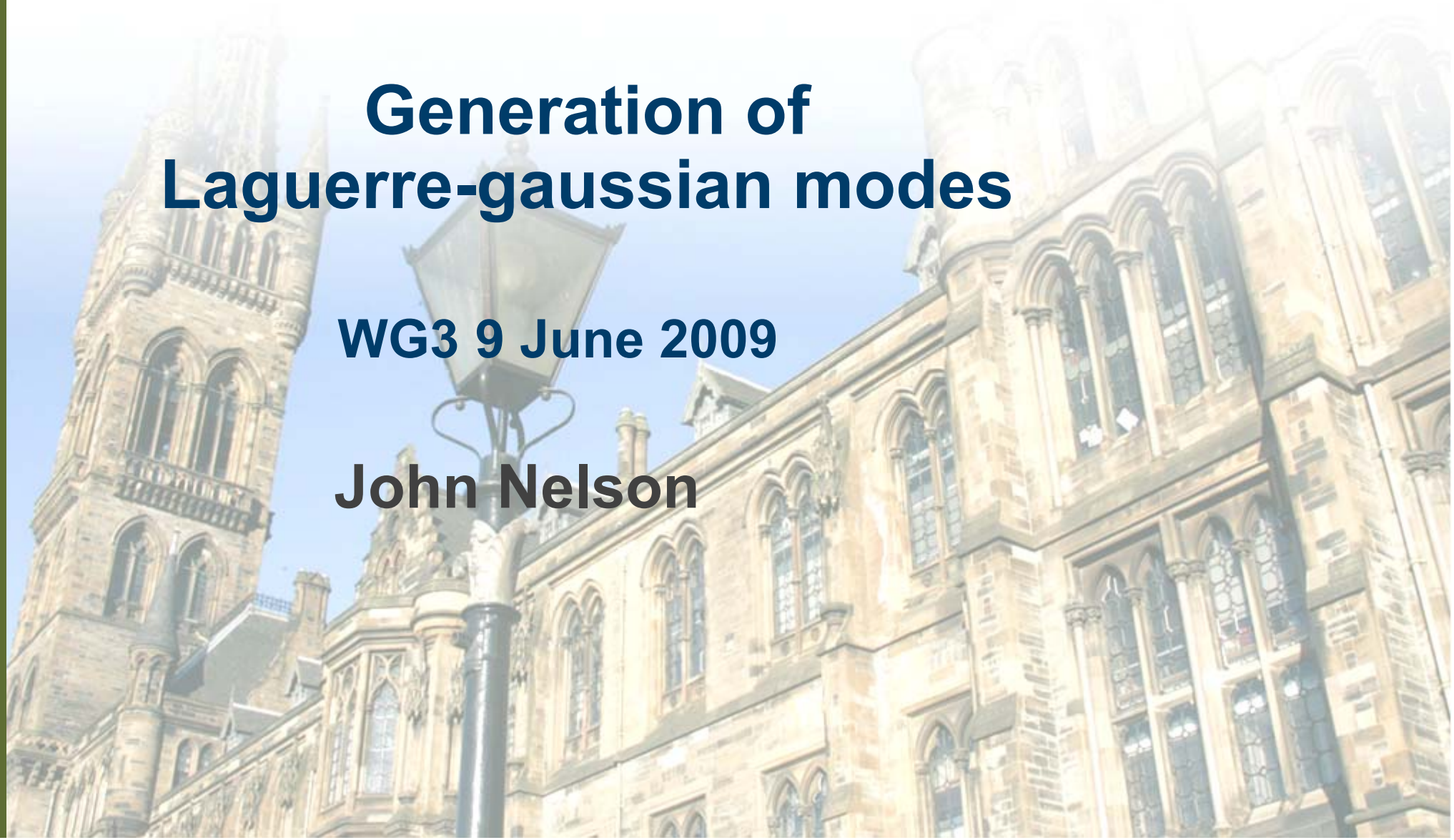

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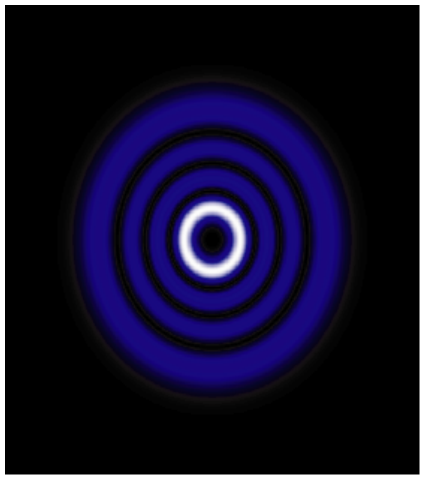
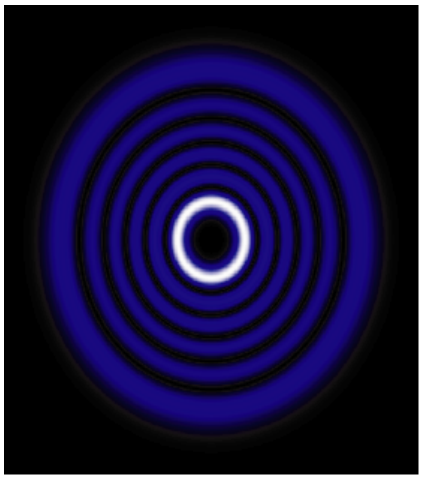
Generation of Laguerre-gaussian modes

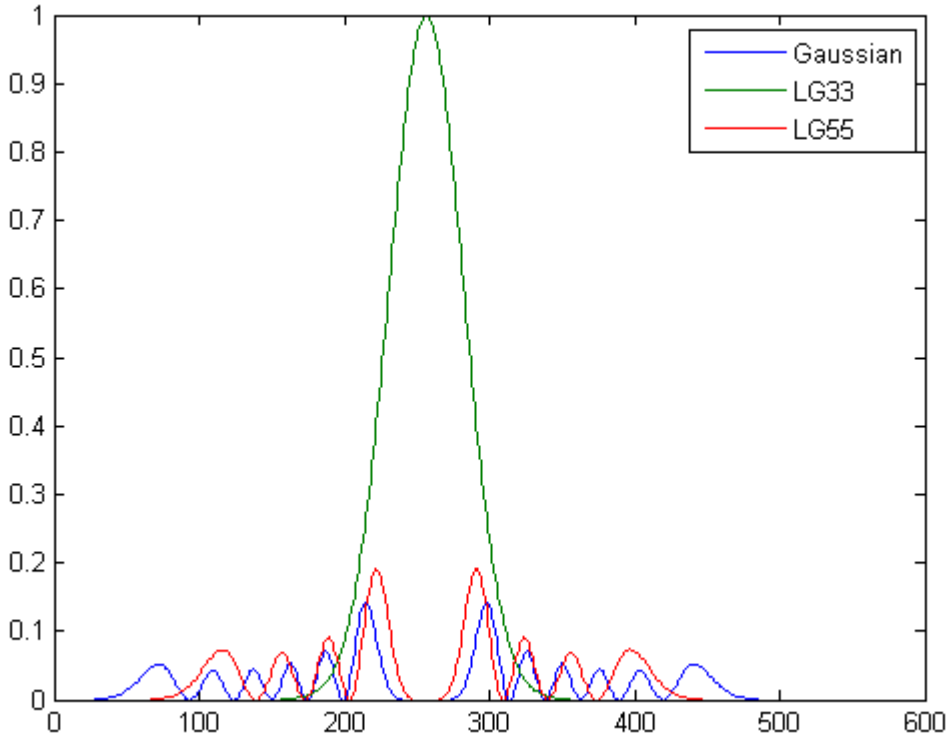
WG3 9 June 2009

John Nelson

Laguerre-gaussian modes







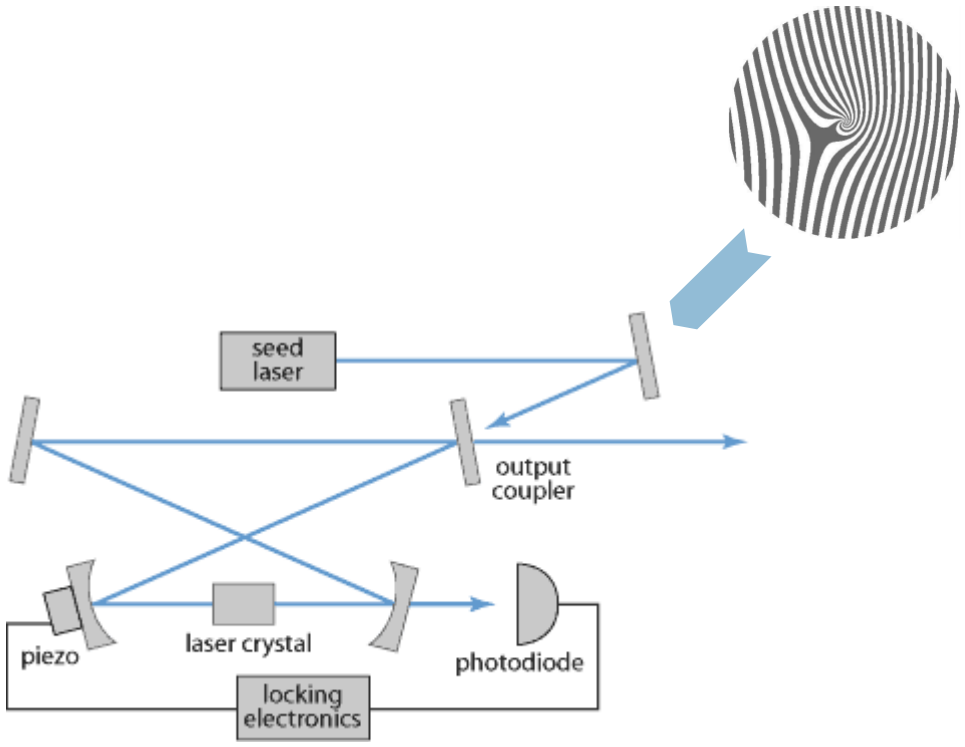
Spatial light modulation

- No point in doing this after we have a high power gaussian beam (>100W) – we'd be losing more than half of the power
- Also, the mode converting optic would have to be able to stand the power – a Spatial Light Modulator certainly wouldn't

Where to convert the mode?

Master/slave laser

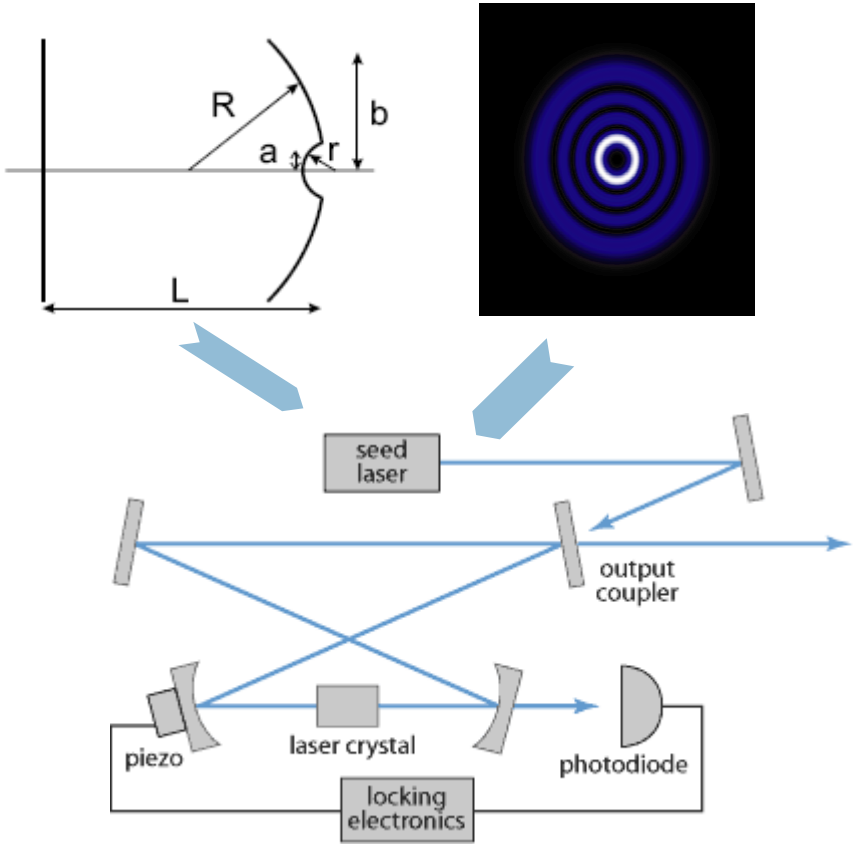
- Take the gaussian output of the master laser and convert to the desired Laguerre-gaussian mode
- Inject this into the slave laser and lock to this mode
- Grating structure can be patterned onto a fused silica substrate



Unusual geometry of master laser cavity?

Bifocal/axicon cavities

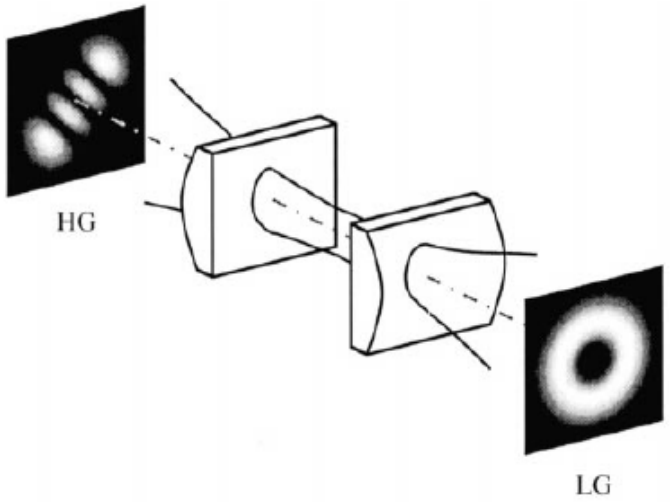
- Don't convert the output of the master laser
- Arrange the laser cavity so that the output is the mode you want

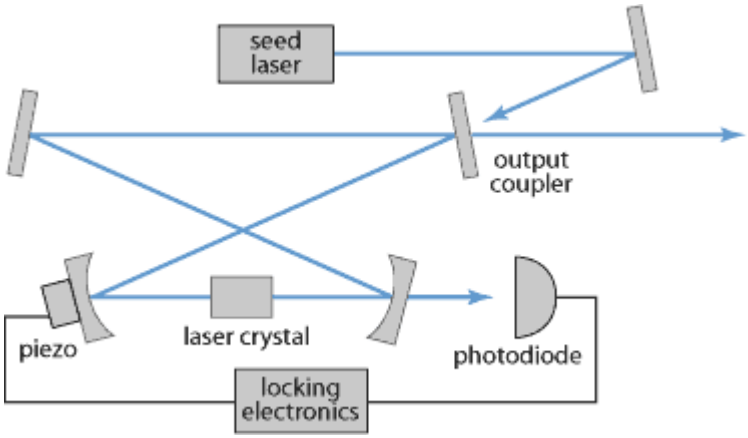


Hermite-guassian master laser?

HG output

- Conventional laser cavity can be aligned to give HG mode output
- Can use an astigmatic mode converter (two cylindrical lenses) to convert to LG mode





Summary

- In principle, there is no reason why we can't generate a high power Laguerre-gaussian mode of any order we want
- Need to look in detail at which method will give the best performance

Laguerre-gaussian modes

Thank you!