

# Multi-phase magnetism in Zn-doped $\text{Cu}_2\text{OSeO}_3$



## Centre for Materials Physics

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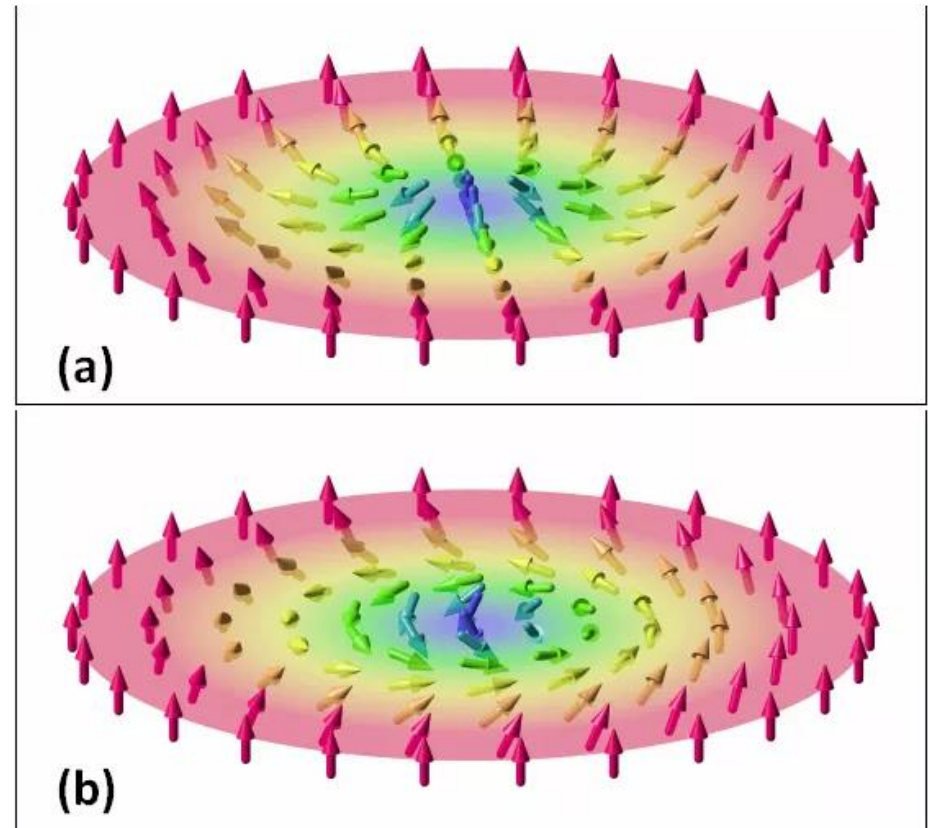


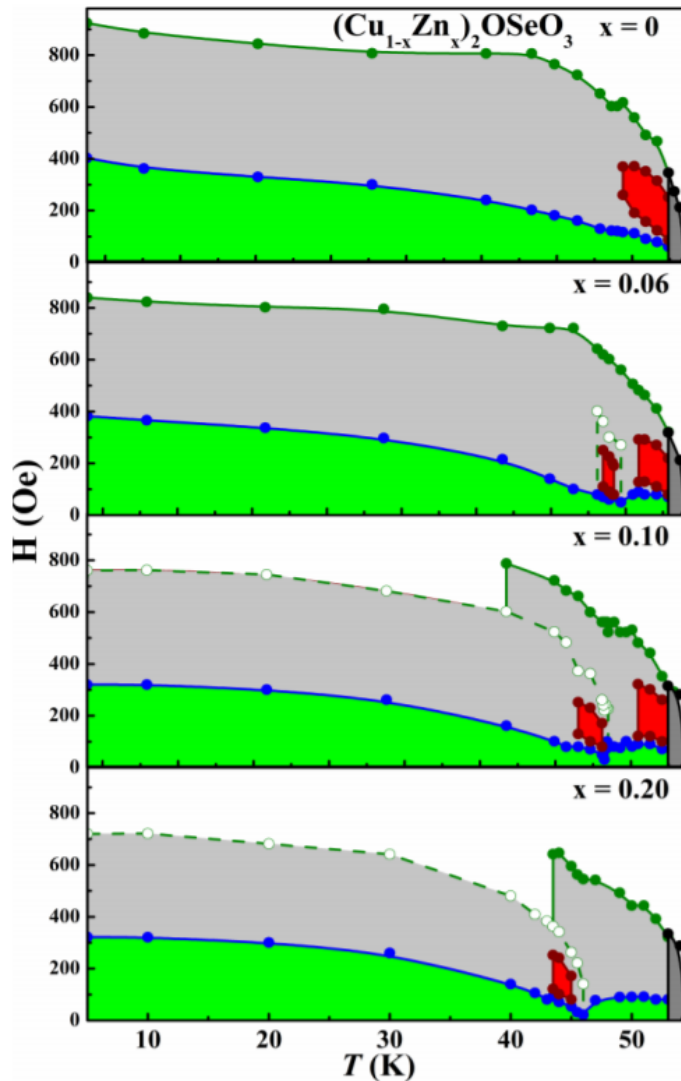
Presentation by  
**Thomas J. Hicken**

- $\text{Cu}_2\text{OSeO}_3$
- Zn-doping
- The question
- Measurements
- Data



- Skyrmion-hosting
- Multiferroic
- $P2_13$  space group
- Two distinct  $\text{Cu}^{2+}$  sites
- Zn can replace Cu

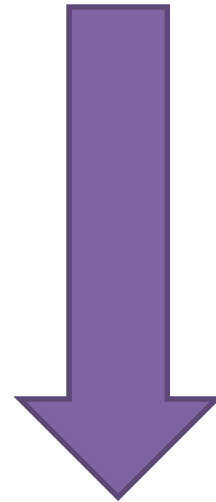




- Helical Ground State
- Conical Order
- Small skyrmion pocket
- Skyrmion-phase splitting with Zn-doping

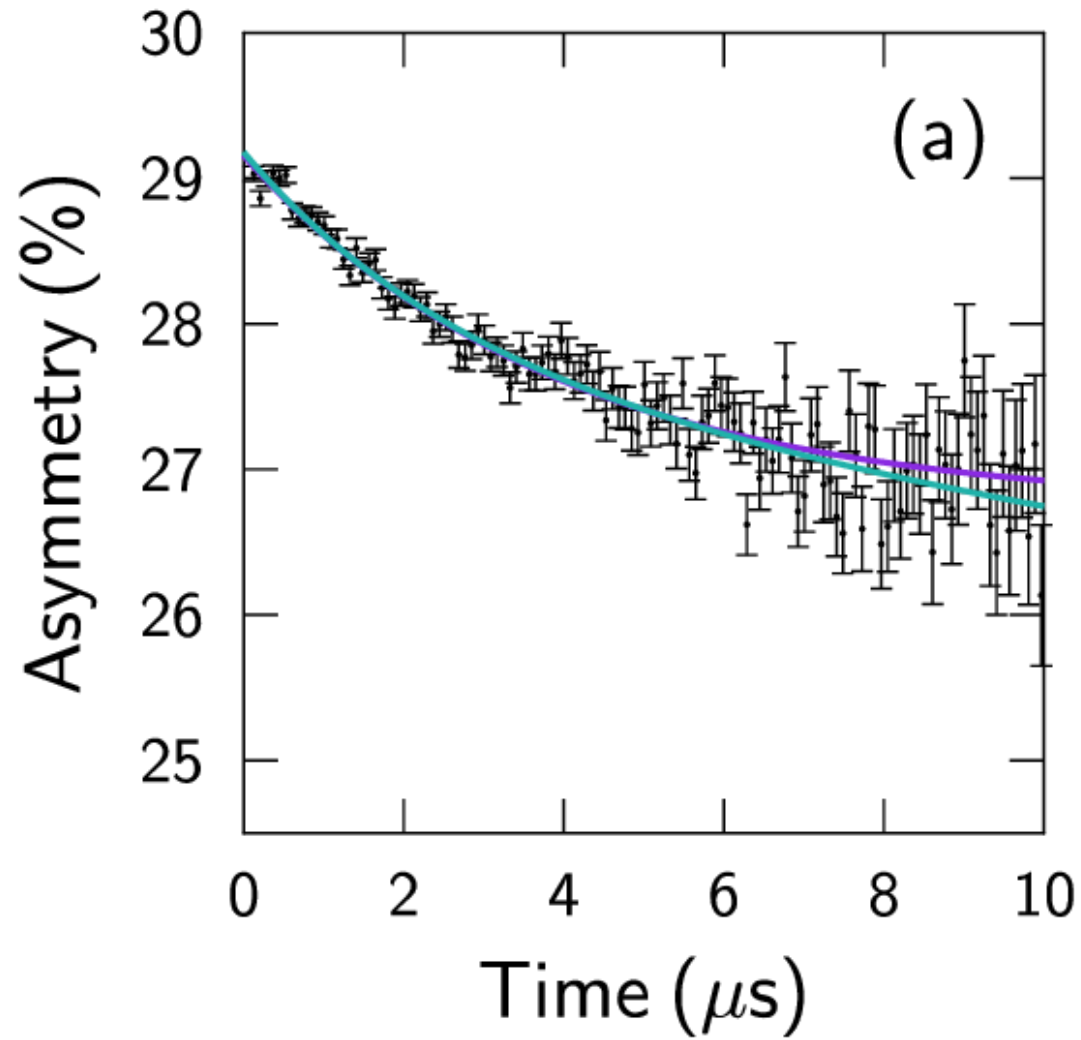
H. C. Wu *et al.*, Scientific Reports **5**, 13579 (2015)

- Dynamics of skyrmion-phase
- Why does the phase split?

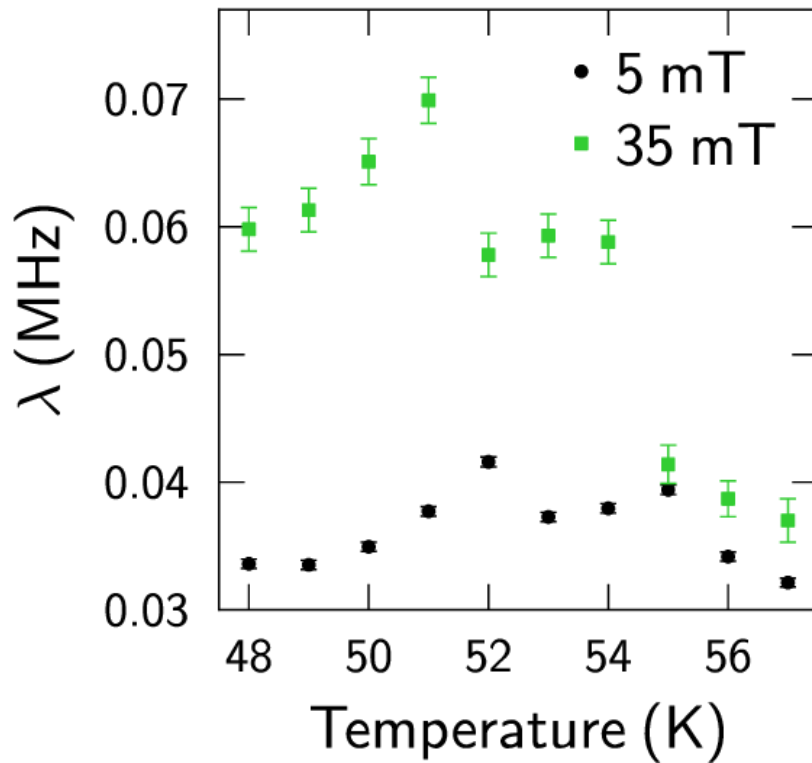


Longitudinal field  $\mu$ SR

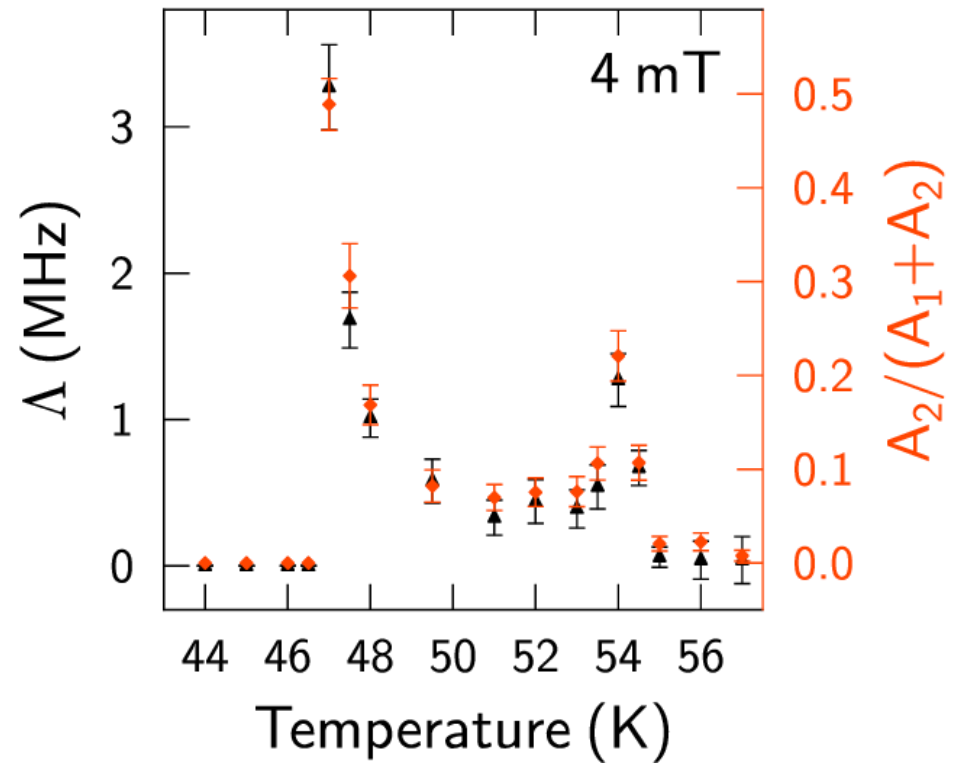
- LF- $\mu$ SR measurements
  - HiFi
  - 0 %, 8 % and 12 % polycrystalline samples
  - Field cutting through the skyrmion phase
  - Fields outside skyrmion phase for comparison



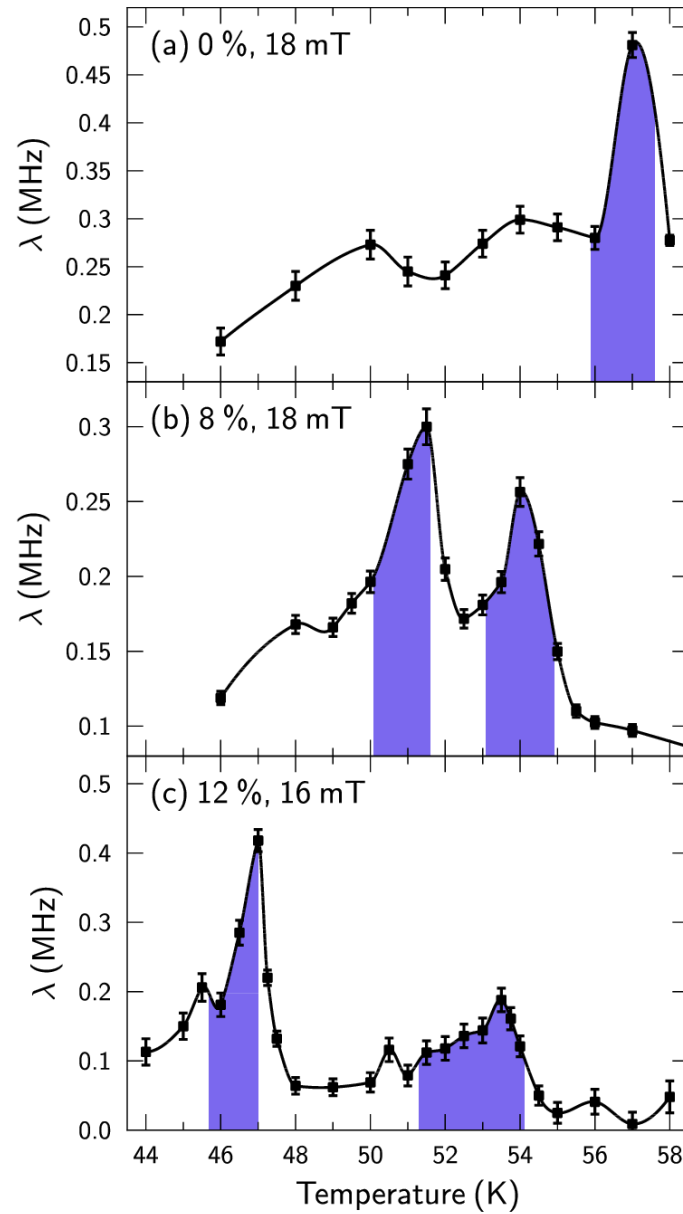
(a) 8 %



(b) 12 %

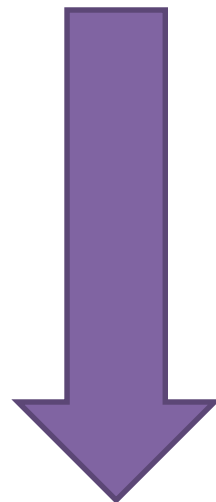




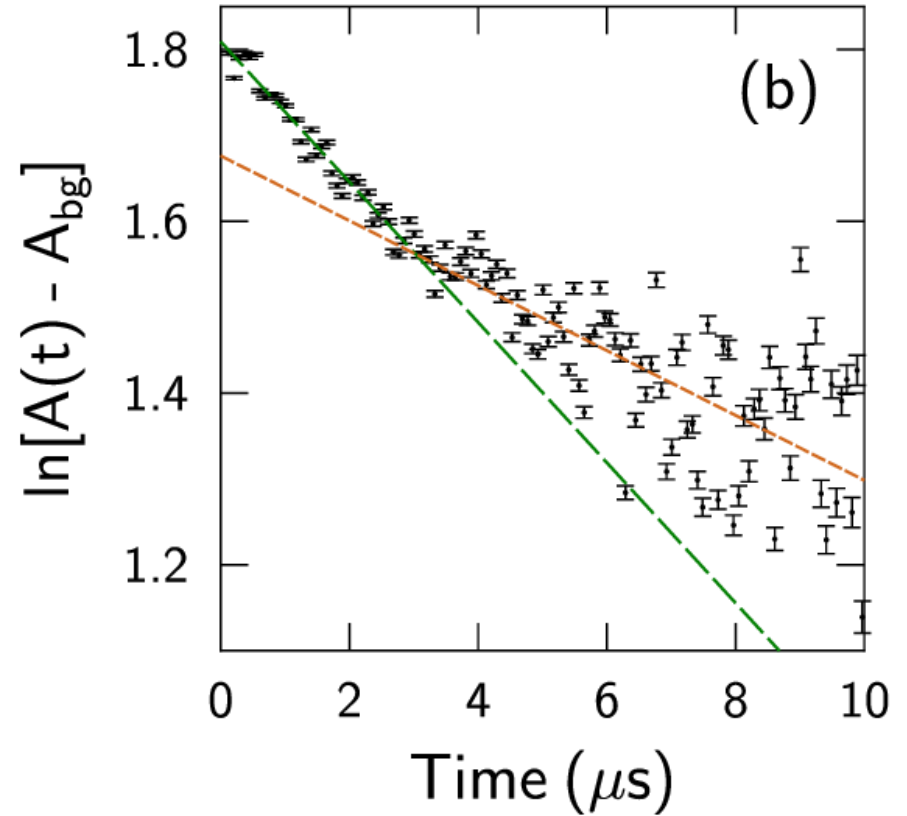
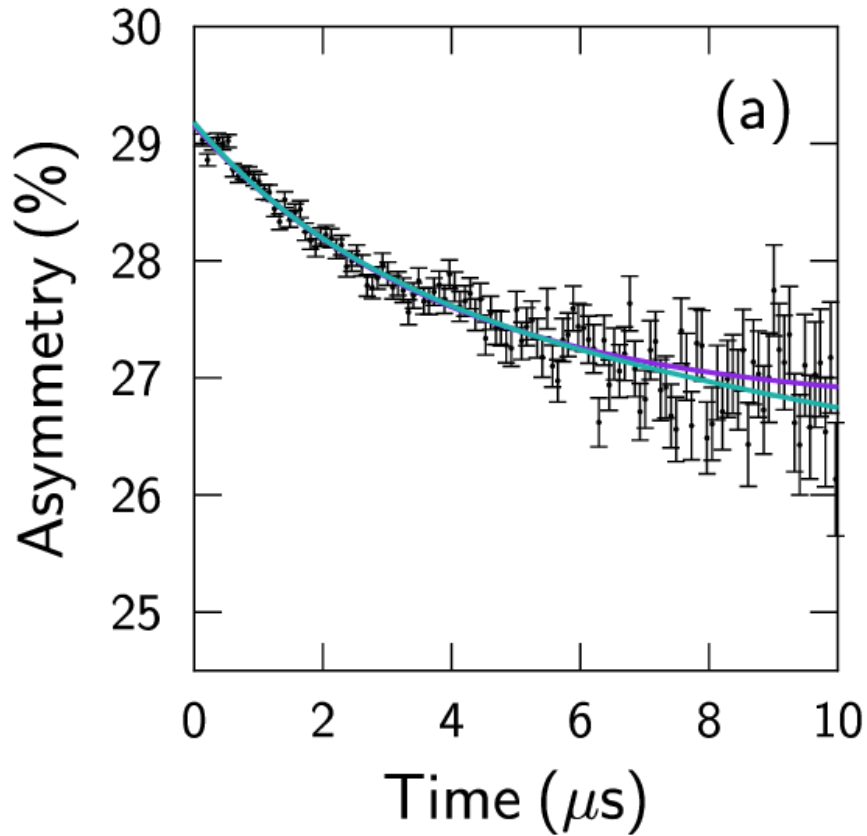




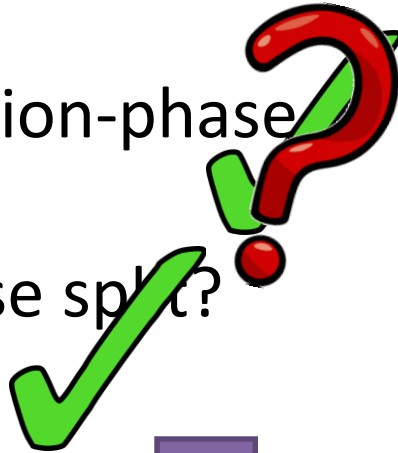
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- Why does the phase split?



Longitudinal field  $\mu$ SR



- Dynamics of skyrmion-phase
- Why does the phase split?



Longitudinal field  $\mu$ SR

# Acknowledgements

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