

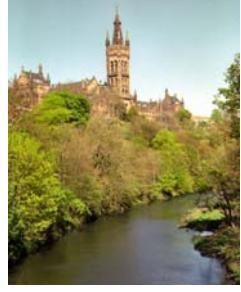
キラル磁性体のスピンダイナミクス Spin dynamics in chiral magnets

Katsuya INOUE
(Chirality Research Center (CResCent) •
Department of Chemistry, Hiroshima
Univ.)

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Lord Kelvin (William Thomson) (1824-1907)
Professor of Natural Philosophy in the University of Glasgow 1846-1899.
First introduced the word chirality into science. Best known for inventing the absolute (Kelvin) temperature scale.

River Kelvin
Laurence Barron, 2018.06

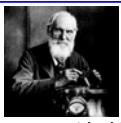
Contents

- Static Chirality and Dynamic Chirality
- Chiral Magnets
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- Summary I
- CSS (Chiral Spin Soliton) in Molecule-based chiral magnet
- Summary

How Interact structural chirality and magnetic chirality

Polar Vector and Axial Vector

Definitions of Chirality



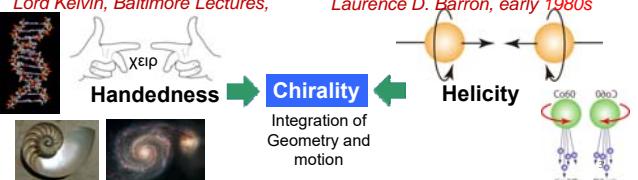
I call any geometrical figure, or group of points, *chiral*, and say that it has *chirality*, if its image in a plane mirror, ideally realized, cannot be brought to coincide with itself.

Lord Kelvin, Baltimore Lectures,



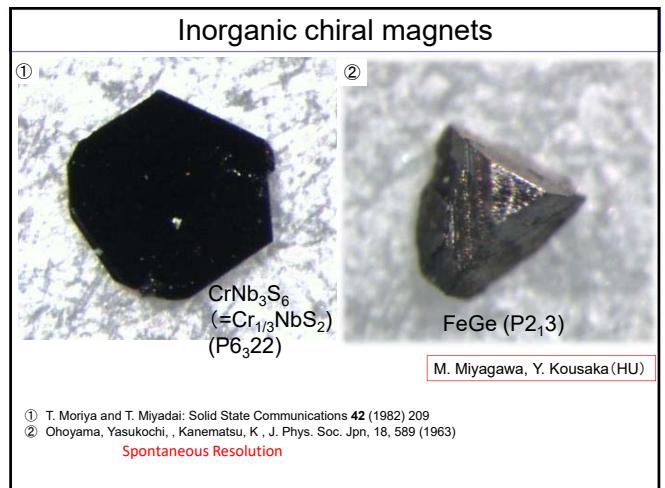
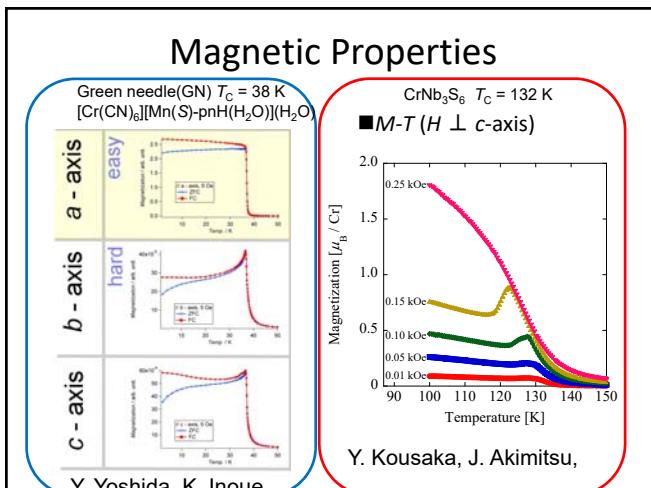
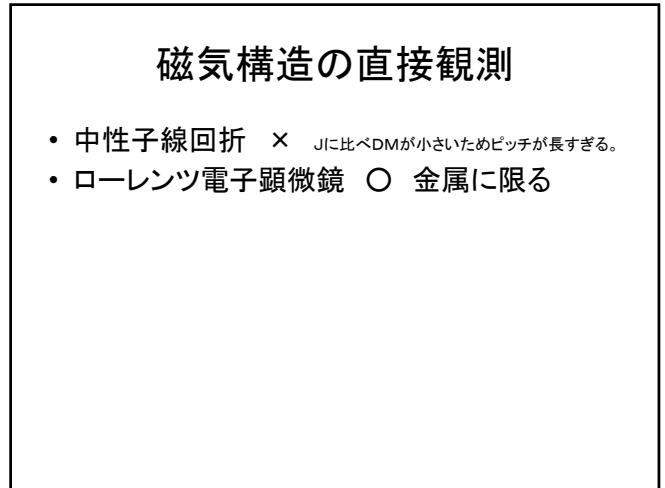
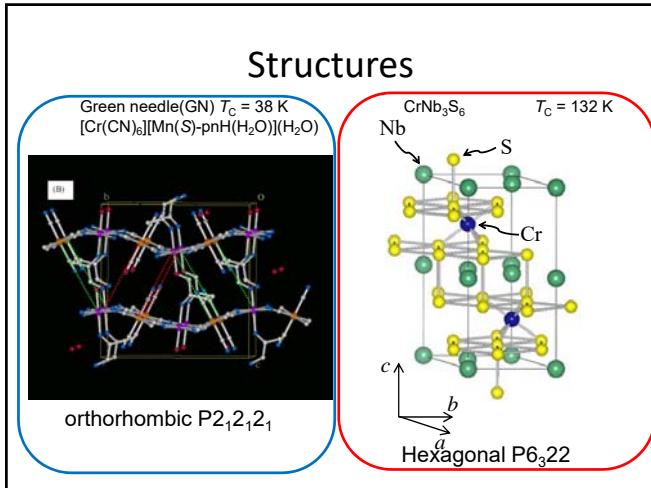
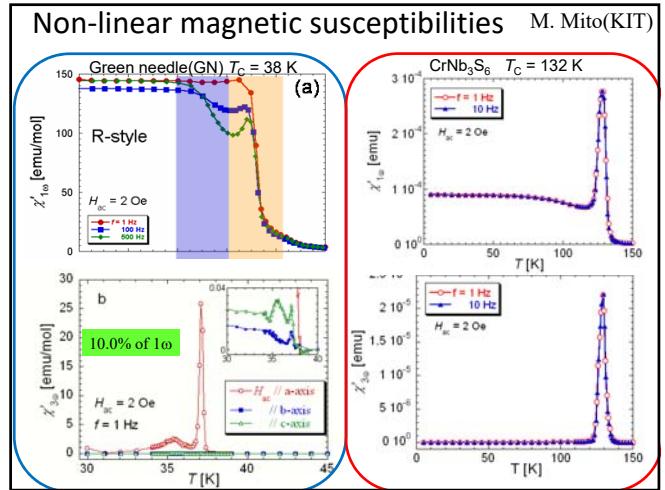
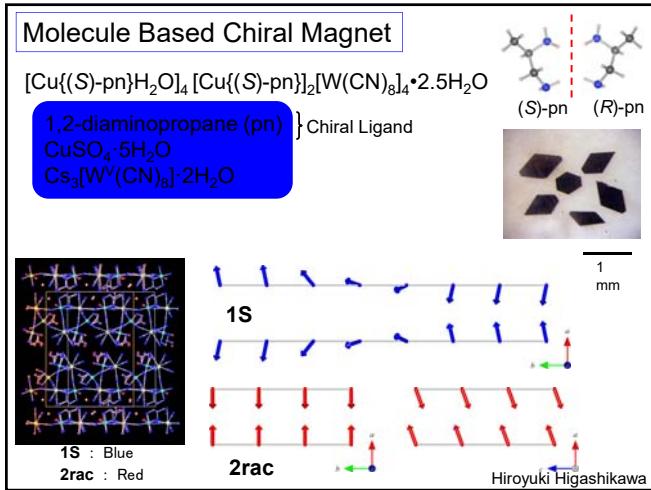
True chirality is shown by systems existing in two distinct enantiomeric states that are interconverted by space inversion, but not by time reversal combined with any proper spatial rotation.

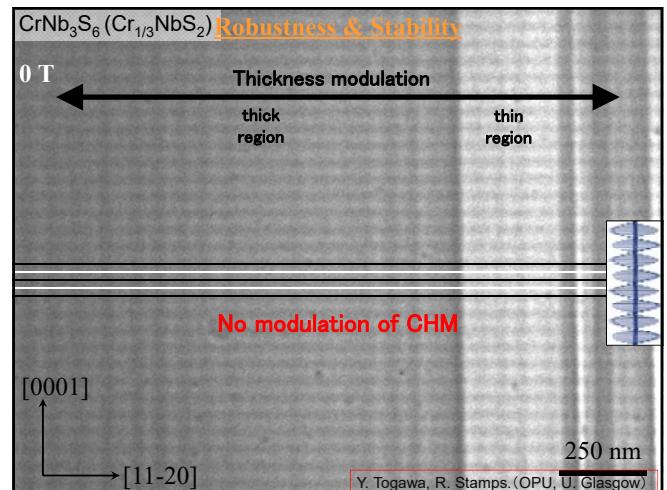
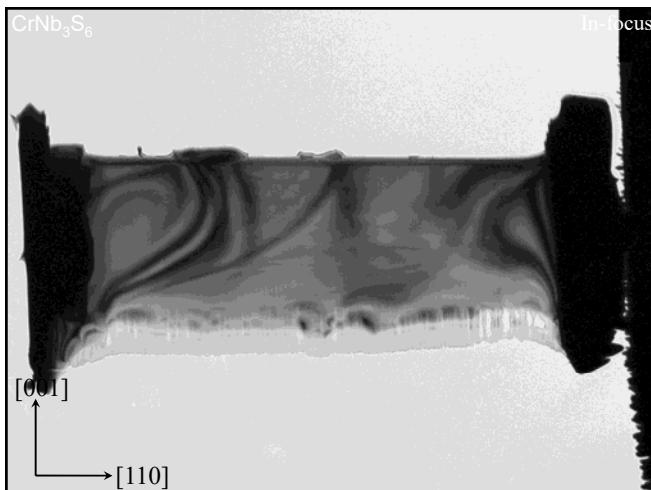
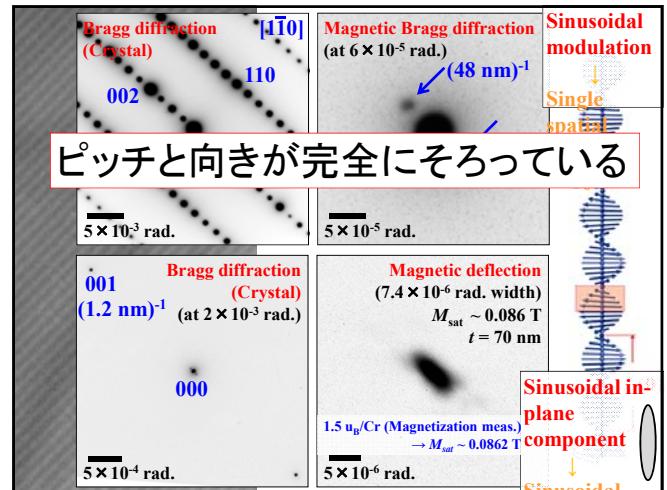
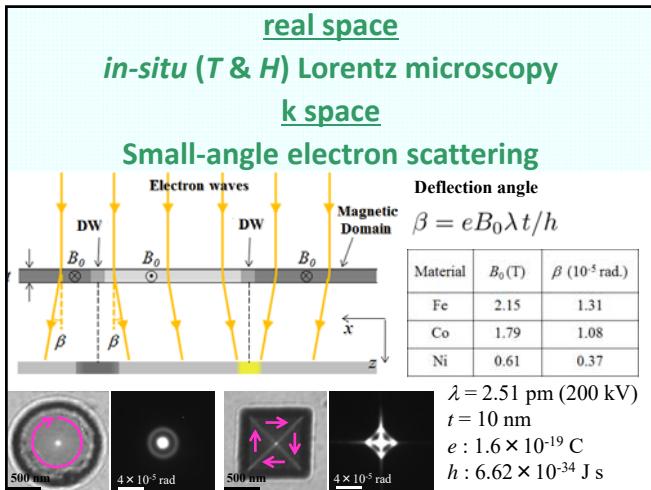
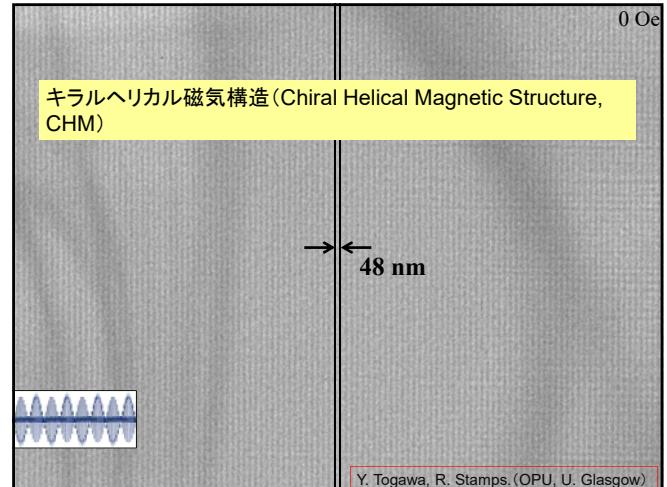
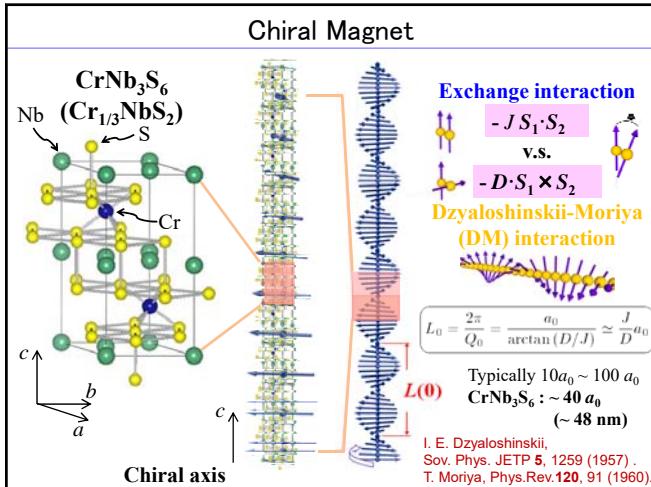
Laurence D. Barron, early 1980s

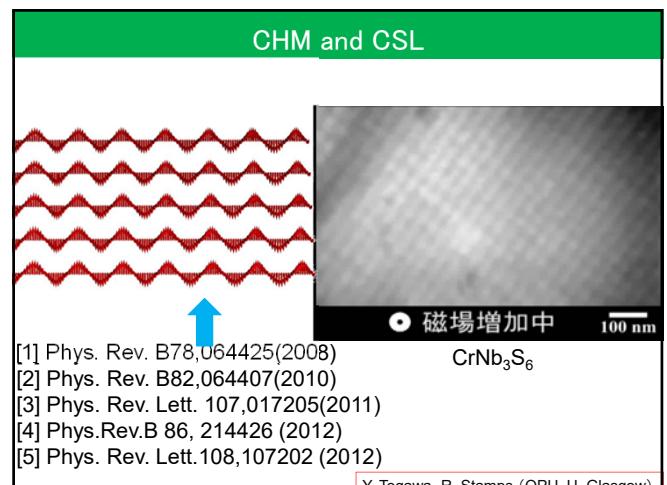
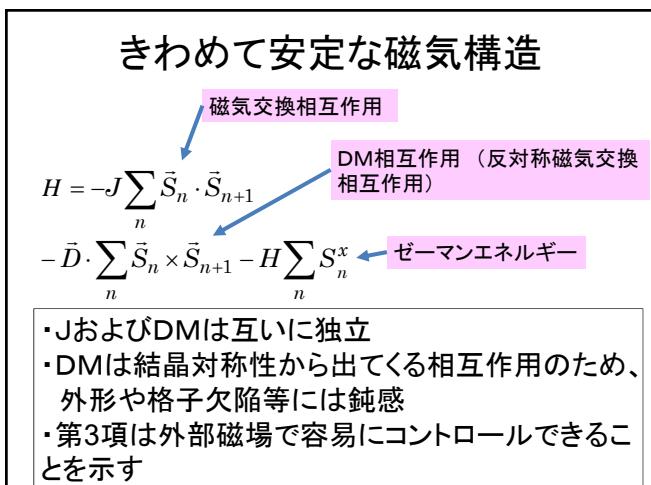
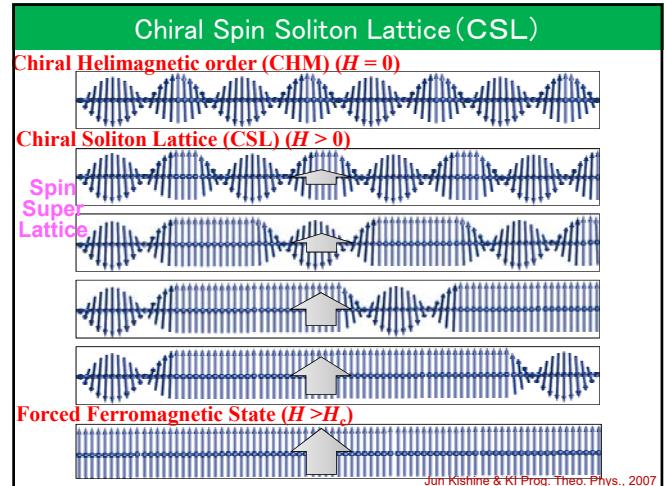
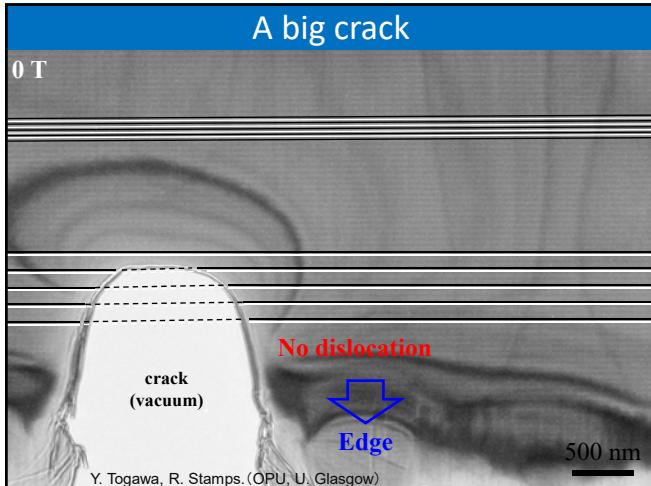
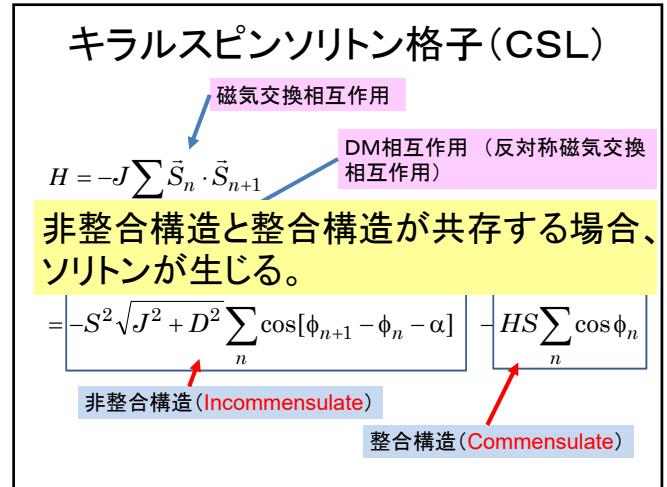
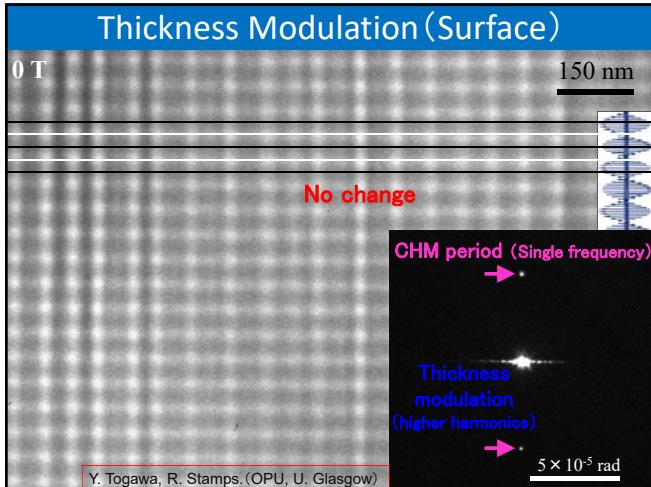


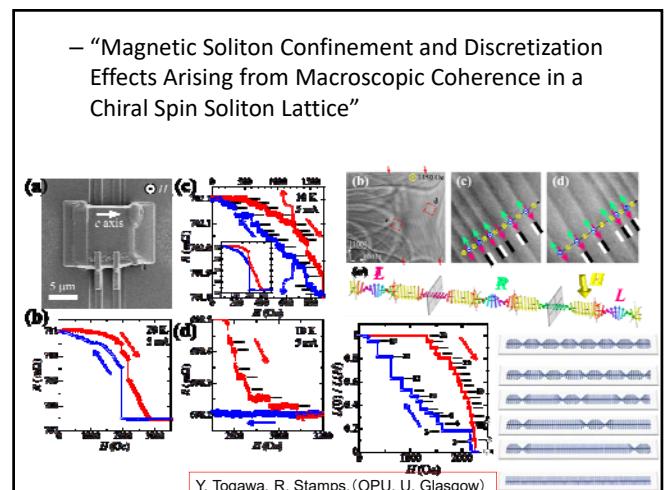
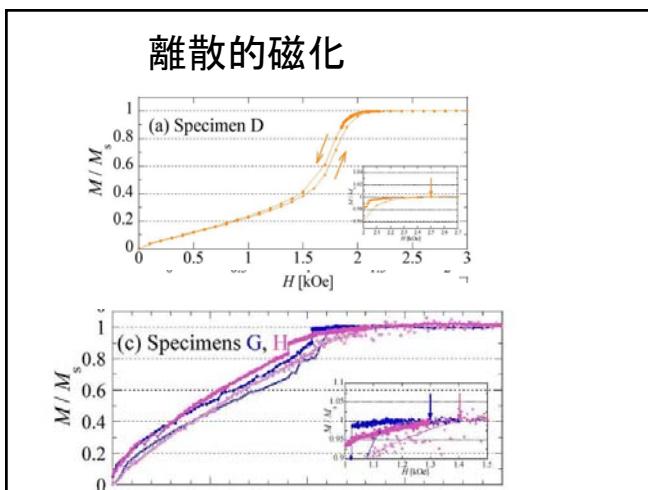
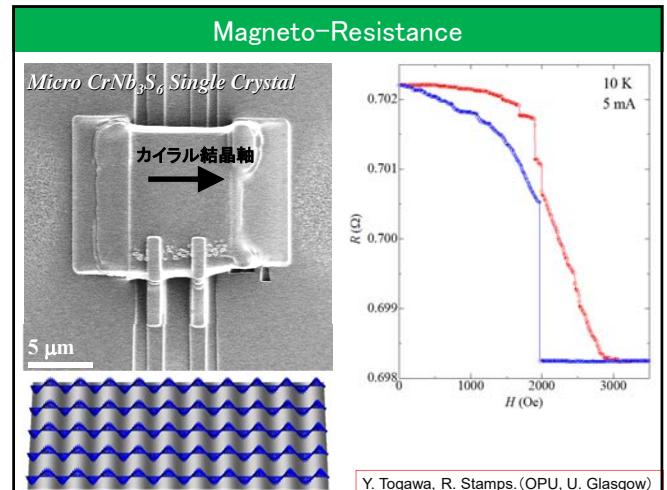
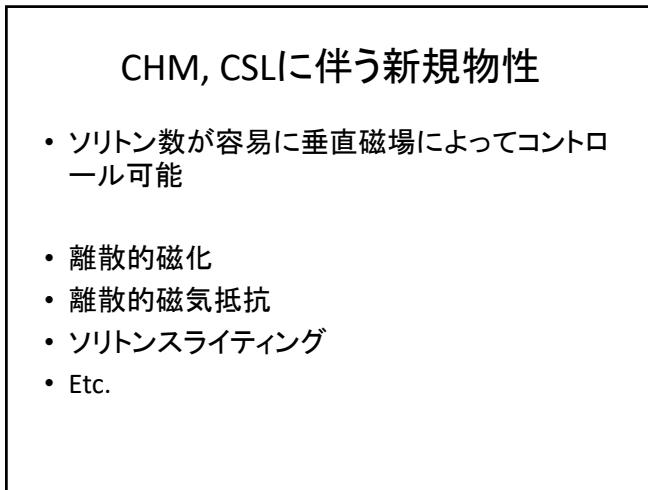
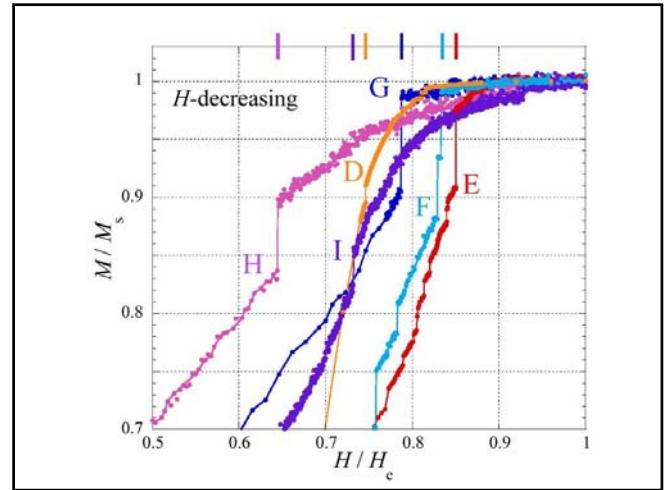
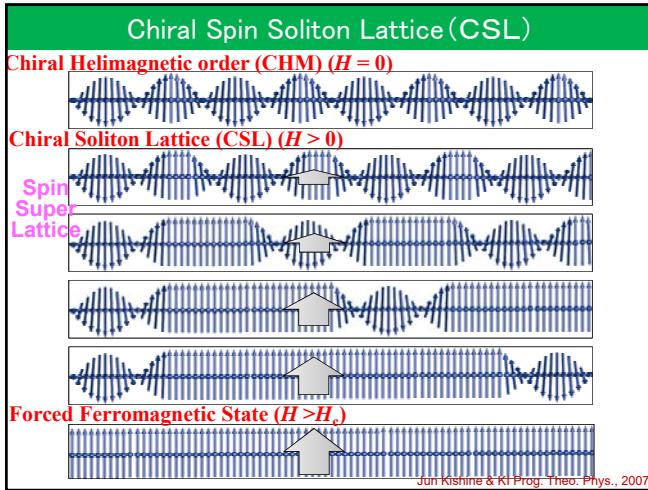
Chiral Magnets

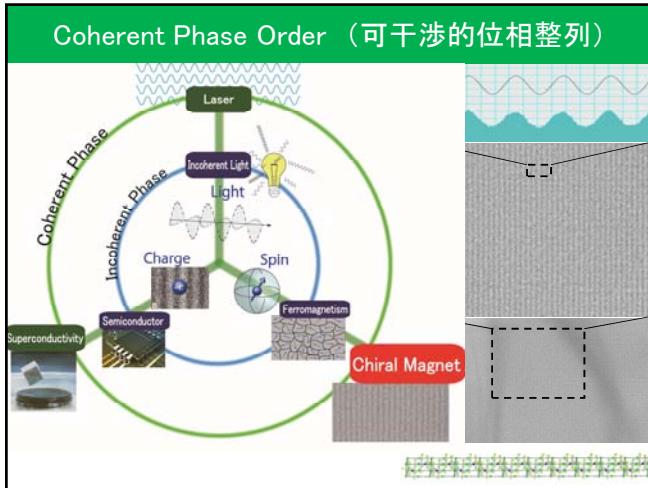
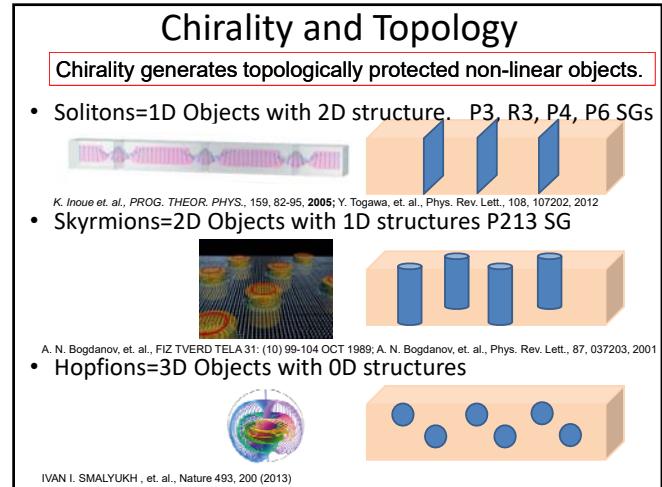
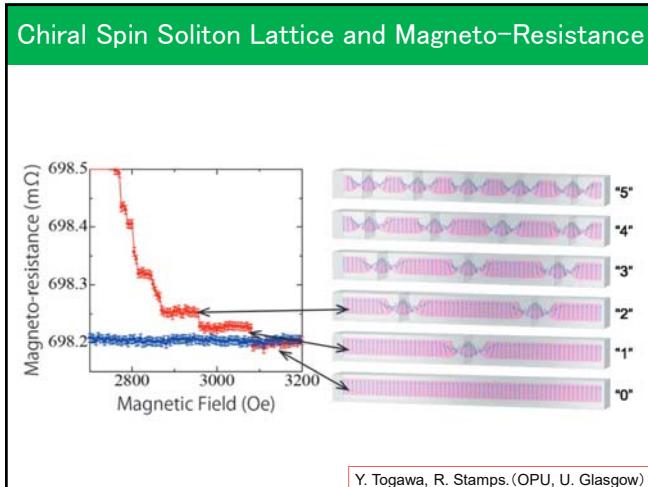






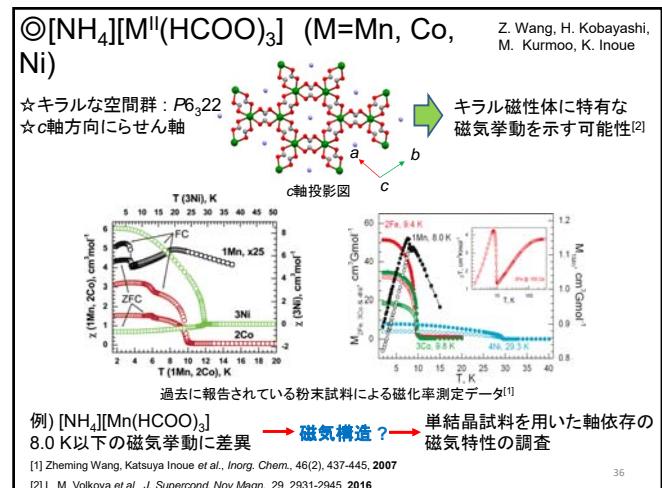
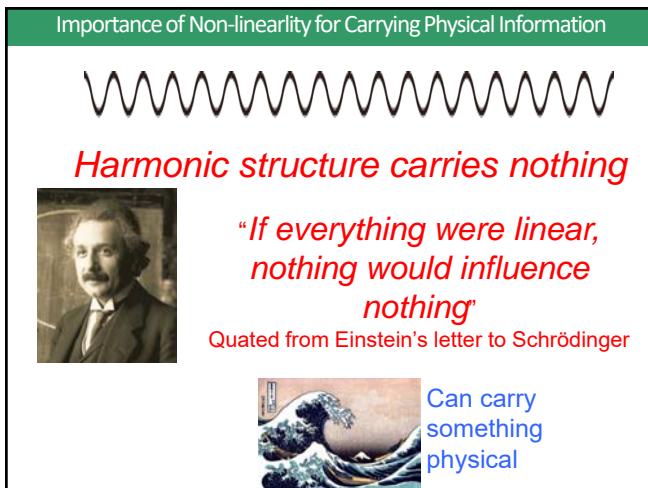


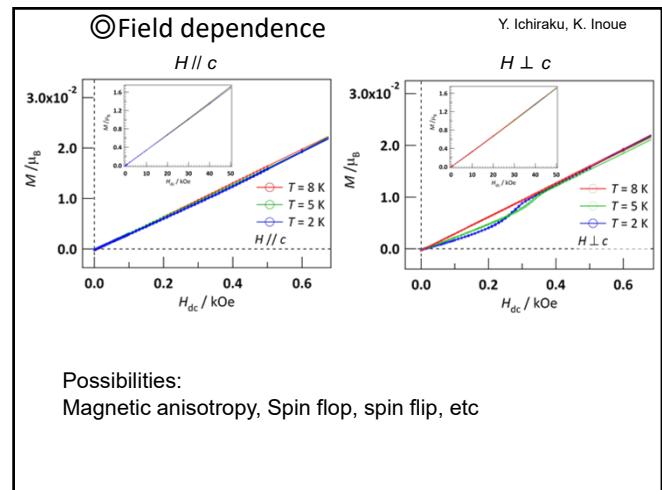
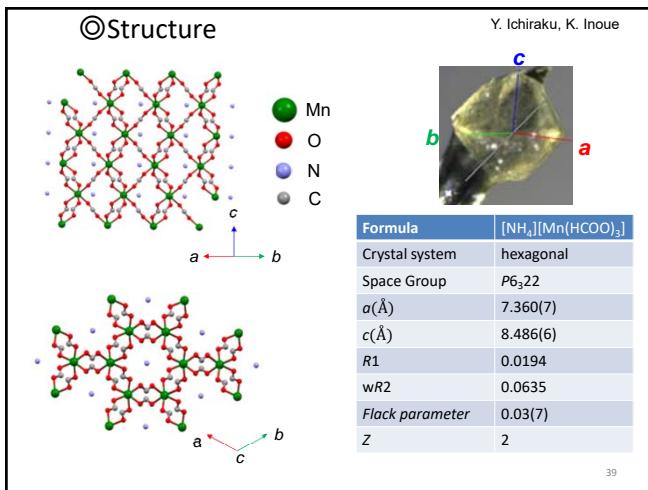
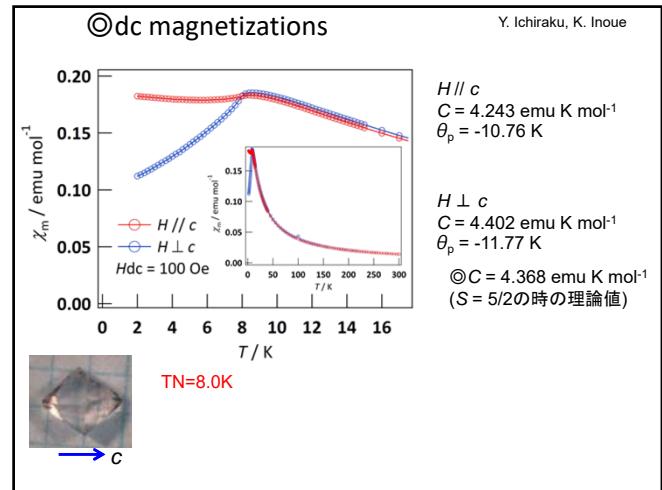
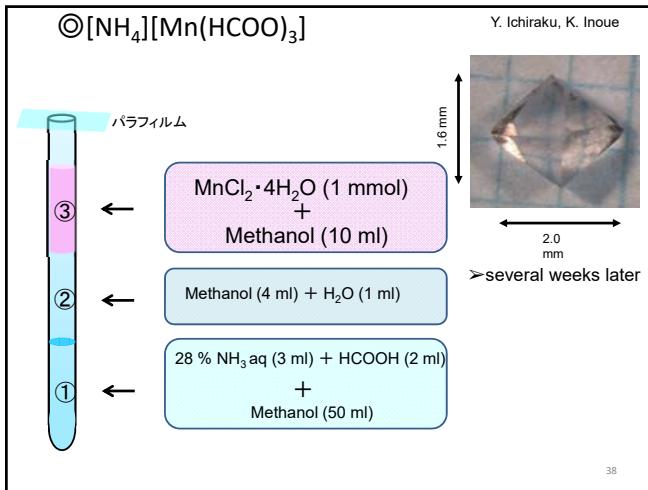
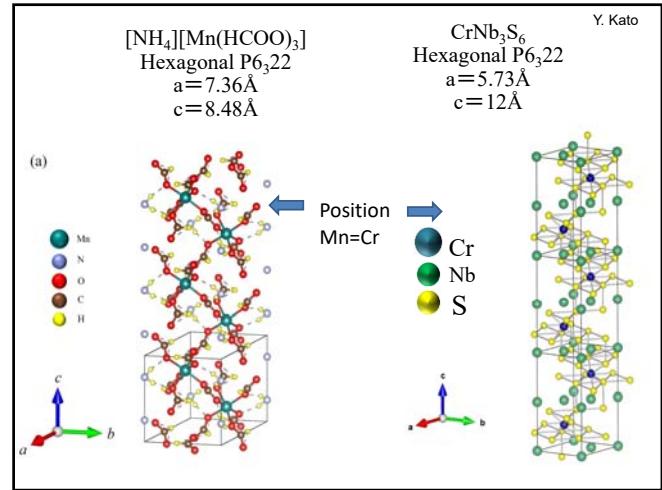
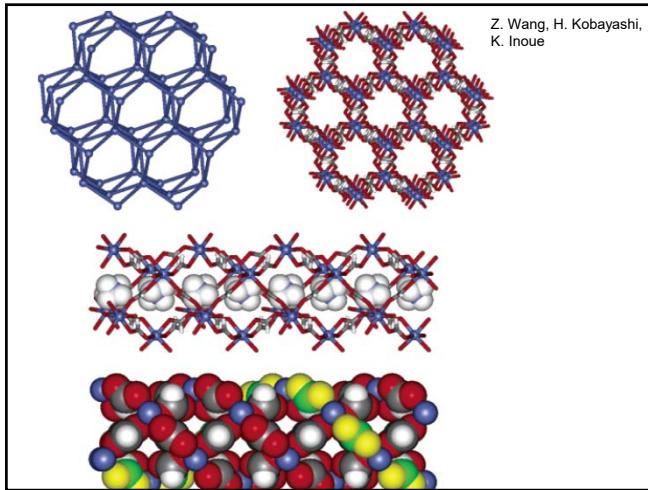


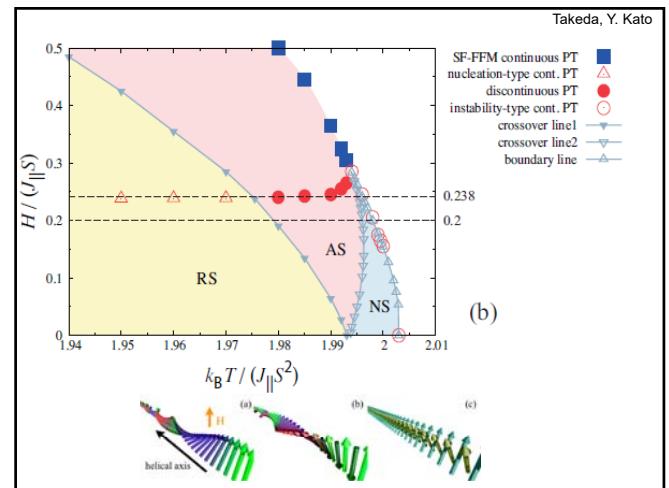
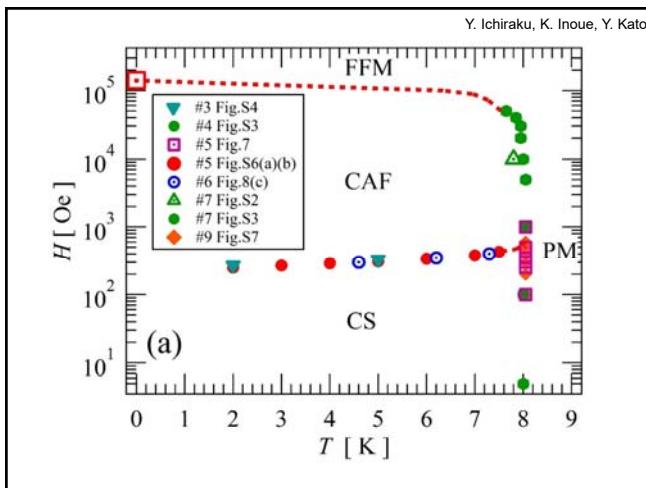
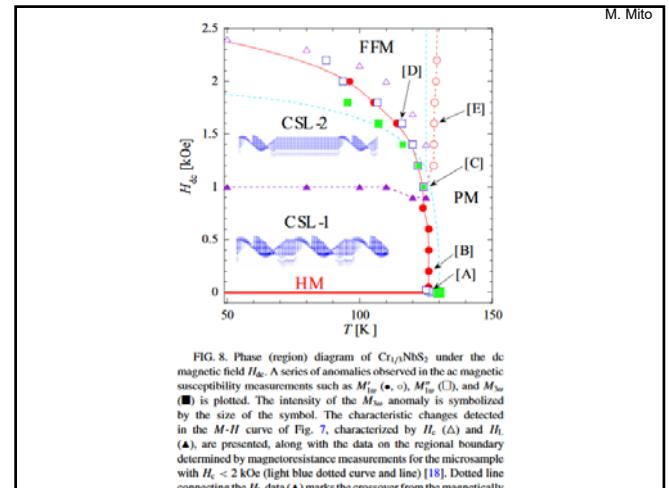
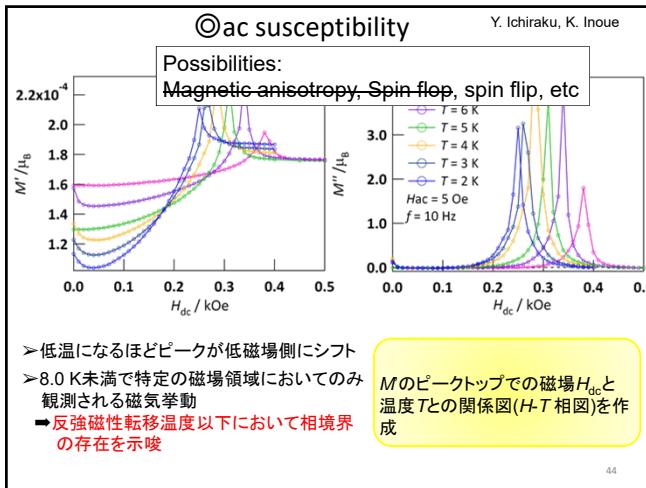
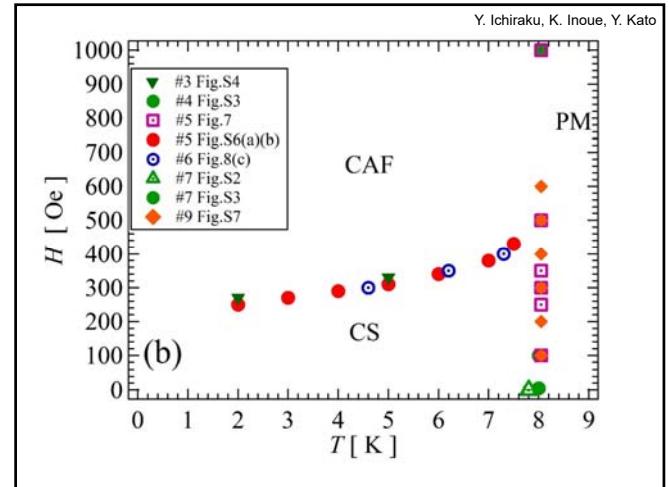
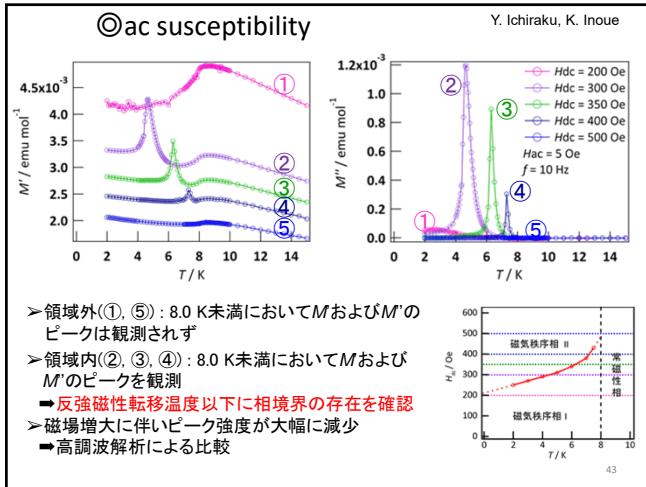


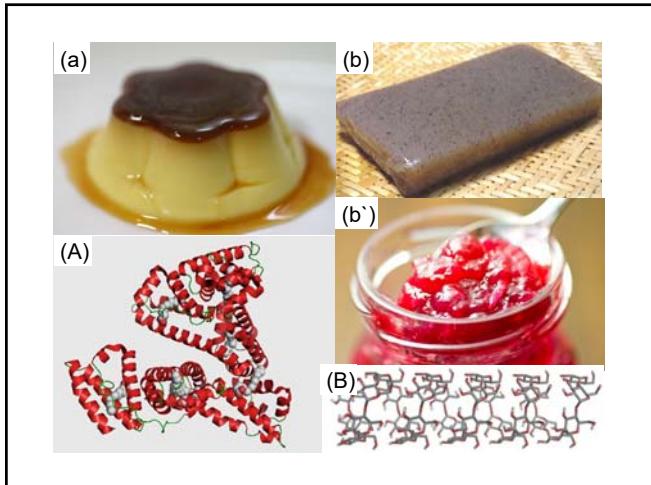
Summary I

- 結晶キラリティはスピン構造に転写される
- CHM、CSLはきわめて安定かつ柔軟な構造
- CSLは非線形孤立波である
- CHMはマクロスケールのスピン位相コヒーレント状態である
- スpin位相コヒーレント状態からはレーザー、超伝導と同じように多彩な新規物性がマクロスケールで現われる









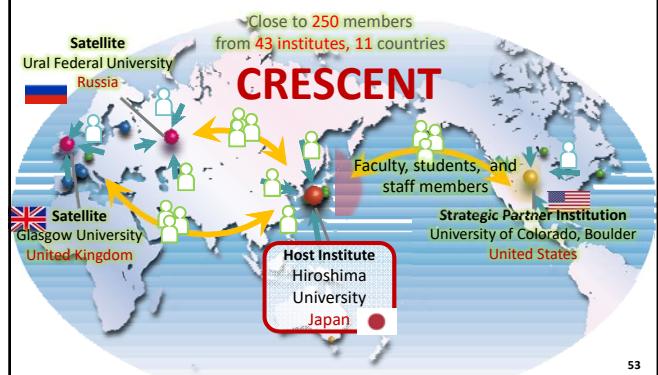
Inoue Lab.



Summary

- 分子性磁性体でもCHM, CSL状態が実現
- 反強磁性ベース($J < 0$)では引力的ソリトンが生成
- Chiralityはスピンシステムにも適用可能である。
- Chiralityは、ユビキタス、スケールフリーである。

Global Network of CRESCENT



おまけ

- 哲学 右手左手の問題(カントの問題)『プロレゴメナ』1783年
 - 化学 キラル
 - 物理 カイラル
 - 数学 ケイル数 (結び目論)
 - 素粒子 カイラルアノマリー
- 生物学 加齢性疾患=キラル破綻？





Hiroshima chiral

Thank you !

