名古屋大学大学院工学研究科

# 特別講演会

イスラエル工科大学 特別教授

## 2011年度ノーベル化学賞受賞者

The Nobel Prize in Chemistry 2011

# ダン・シェヒトマン氏

## *Quasi-periodic Crystals – A Paradigm Shift In Crystallography*


D. Shechtman

*Technion, Haifa, Israel and ISU, Ames, Iowa, USA*


Crystallography has been one of the mature sciences. Over the years, the modern science of crystallography that started by experimenting with x-ray diffraction from crystals in 1912, has developed a major paradigm – that all crystals are ordered and periodic. Indeed, this was the basis for the definition of "crystal" in textbooks of crystallography and x-ray diffraction. Based upon a vast number of experimental data, constantly improving research tools, and deepening theoretical understanding of the structure of crystalline materials no revolution was anticipated in our understanding the atomic order of solids.

However, such revolution did happen with the discovery of the Icosahedral phase, the first quasi-periodic crystal (QC) in 1982, and its announcement in 1984 [1, 2]. QCs are ordered materials, but their atomic order is quasiperiodic rather than periodic, enabling formation of crystal symmetries, such as icosahedral symmetry, which cannot exist in periodic materials. The discovery created deep cracks in this paradigm, but the acceptance by the crystallographers' community of the new class of ordered crystals did not happen in one day. In fact it took almost a decade for QC order to be accepted by most crystallographers. The official stamp of approval came in a form of a new definition of "Crystal" by the International Union of Crystallographers. The paradigm that all crystals are periodic has thus been changed. It is clear now that although most crystals are ordered and periodic, a good number of them are ordered and quasi-periodic.

While believers and nonbelievers were debating, a large volume of experimental and theoretical studies was published, a result of a relentless effort of many groups around the world. Quasi-periodic materials have developed into an exciting interdisciplinary science.

This talk will outline the discovery of QCs and describe the important role of electron microscopy as an enabling discovery tool.


[1] D. Shechtman, I. Blech, Met. Trans. 16A (June 1985) 1005-1012.
[2] D. Shechtman, I. Blech, D. Gratias, J.W. Cahn, Phys. Rev. Letters, Vol 53, No. 20 (1984) 1951-1953.


2014年

## 5月12日(月)

10:30～ 受付 9:30～

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|---|---|
| 場　所 | 名古屋大学IB電子情報館2階 大講義室 |
| 主　催 | 名古屋大学大学院工学研究科 |
| 対　象 | 本学教職員・学生、学外研究者ほか |
| 言　語 | 英語(シェヒトマン氏の講演は英語のみでの提供となります) |
| 費　用 | 無料 |

### *Program*

●主催者代表挨拶(10:30–10:35)
名古屋大学大学院工学研究科長　松下 裕秀

●解説講演(10:35–10:55)
題目:「The Expanding Universe of Quasicrystals」
近畿大学理工学部教授　堂寺 知成 氏

●特別講演(10:55–11:55)
題目:「Quasi-periodic Crystals – A Paradigm Shift In Crystallography」
イスラエル工科大学 特別教授
2011年度ノーベル化学賞受賞者(The Nobel Prize in Chemistry 2011)
ダン・シェヒトマン(Dan Shechtman)氏

●質疑応答(11:55–12:15)

### *Entry*

**本講演は学内だけでなく、学外の方でもご参加いただけます。**
参加をご希望の方は、下記まで事前に電話またはE-mailでお申込みください。(参加を希望される方全員のお名前、ご所属先、ご連絡先の電話番号およびE-mailアドレスを記載)

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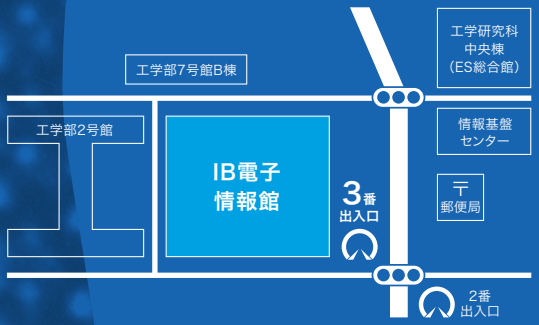
### *Access*

地下鉄名城線「名古屋大学」駅3番出入口直結




Graphics : Quasicrystals / AlCuFe , TSAI An-Pang / Tohoku Univ.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