

21COE 物質階層融合科学セミナー
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日時 : 3月22日(月) 16:00 - 17:30

場所 : 理学部 総合研究棟 大学院講義室 (745号室)

講師 : Prof. Amand A. LUCAS (University of Namur)

題目 : Diffraction of X-rays and of electrons by helical molecules: determination of the structure of DNA and Carbon nanotubes.

要旨 : The ubiquitous and beautiful helical organization of the biological world at the molecular level of DNA [1], protein alpha-helices [2], etc... as well as at the mesoscopic scale of viruses [3], cellular fibers [4], etc... has been investigated mostly by diffraction methods. More recently Carbon nanotubes were discovered [5] by high resolution electron microscopy and their detailed atomic structure has again been determined by electron diffraction [5], [6]. In this lecture I will use optical simulation experiments (the optical transform method) to explain just how X-ray fiber diffraction and electron diffraction have been used to reveal the helical arrangements of DNA and Carbon nanotubes [7]-[9].

The audience will have the opportunity to take part, hands on, in the optical simulation experiments.

[1] Franklin R.E. and Gosling R.G., Nature **171**, 740, 1953; Watson J.D. and Crick F.H.C., Nature **171**, 737, 1953

[2] Cochran W., Crick F.H.C. and Vand V., Acta Crystallogr. **5**, 581, 1952

[3] Klug A. and Finch J.T., J. Mol. Biol. **31**, 1, 1968

[4] Amos L.A. and Baker T.S., Nature **279**, 607, 1979

[5] Iijima S., Nature **354**, 56, 1991

[6] Lambin Ph. and Lucas A.A., Phys. Rev. **B56**, 3571, 1997

[7] Lucas A.A., Lambin Ph., Mairesse R. and Mathot M., J. Chem. Educ. **76**, 378 (1999)

[8] Lucas A.A., Moreau F. and Lambin Ph., Rev. Mod. Physics, vol 74, 1, 2002.

[9] Lucas A.A., Int. J. Quantum Chemistry **90**, 1491-1504 (2002).

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15:45よりコーヒー、紅茶、お菓子を用意します。カップを持ってお集まり下さい。

世話人 高橋 隆 (217-6417) 中島龍也 (217-6441)

松井広志 (217-6604) 内田就也 (217-7756)