



The CREAtion of the Department of Physical Chemistry of Biological SysTEms [CREATE]

666295 — CREATE — H2020-WIDESPREAD-2014-2015/H2020-WIDESPREAD-2014-2

**Report on the visit of Prof. Christopher Dainty
[WP3]**

Level of dissemination: PUBLIC

Warsaw, October 2018



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INTRODUCTION

The visit of Prof. Christopher Dainty at the Institute of Physical Chemistry of the Polish Academy of Sciences (IPC PAS) was held under a series of cyclical lectures on interdisciplinary emerging research.

One of the main goals of this visit, arranged by ERA Chair holder, was to deliver a scientific seminar, give a lecture to PhD students and have a meeting regarding possible improvements in IPC PAS, as well as participate in short meetings with synergetic teams to support mentoring activity of the ERA Chair holder.

Professor Chris Dainty was the Professorial Research Associate at **the Institute of Ophthalmology, University College London**. During his career, Prof. Dainty has investigated problems in optical imaging, scattering and propagation. In these areas, he has co-authored or edited six books, approximately 140 peer-reviewed papers and 220 conference presentations. His current interests are focused in imaging and metrology, especially in the eye.

Chris Dainty is the recipient of:

- the 1984 International Commission of Optics Prize (ICO),
- the 1993 Thomas Young Medal and Prize (UK Institute of Physics),
- the 2003 C E K Mees Medal and Prize (OSA),
- the Optics and Photonics Division Prize 2004 (IoP)
- and the 2017 Robert E Hopkins Leadership Award (OSA).

He is also a Fellow of The Optical Society of America, SPIE, The Institute of Physics (UK) and The European Optical Society.

Among other important activities, Prof. Dainty was President of The European Optical Society from 2002 to 2004. In 2011, he was President of the Optical Society of America. From 1994 to 2002 he was editor of Optics Communications, handling almost 5000 manuscripts over nine years. He was also elected a Member of the Royal Irish Academy in 2008.

COURSE OF THE VISIT

The visit took place between 1-3 October 2018 [see [annex 1 for agenda](#)] and was planned for 3 days, with two seminar lectures and several meetings. It was started with a welcoming meeting organized by the Deputy Director of IPC PAS, to get a general overview of the Institute.

Following, Prof. Dainty delivered a seminar entitled "Fundamental Limits of Mobile Phone Cameras". The seminar was held in the assembly hall of the IPC PAS. All researchers and PhD students employed in the IPC PAS were invited to participate in this seminar.



The seminar of Prof. Chris Dainty, assembly hall, 1 October 2018

Guest explained basic optical principles of building lens systems for small cameras and showed its application in industrial science. Besides theoretical part, Prof. Dainty presented many examples of practical use of such systems and explained what are the key-features for the market side. He gave many insight information about his recent project of camera system for Apple devices.

Abstract of the seminar

Phone cameras have transformed photography: for example, every day around 3 billion pictures are shared on the internet. From an aesthetic design and commercial perspective, there is a drive towards smaller and smaller cameras, but elementary physics tells us that, in imaging, “small is bad”. In this talk, I shall explain what the fundamental limits of phone cameras are, and the steps being taken to mitigate them through new hardware and software.

The seminar was showing an interesting interplay between the academic and industrial side of optical science. It was followed by a lab-tour and discussion on the research projects, individually with Physical Optics and Biophotonics Group members.

Afterwards, on Tuesday, the main activity was dedicated to another lecture given by Prof. Dainty, about pros and cons of staying in academia. Under the “Should I stay, or should I go” working title, participants discussed different aspects of the scientific career, with its cross-sectoral dimension and a high focus on transferable skills.

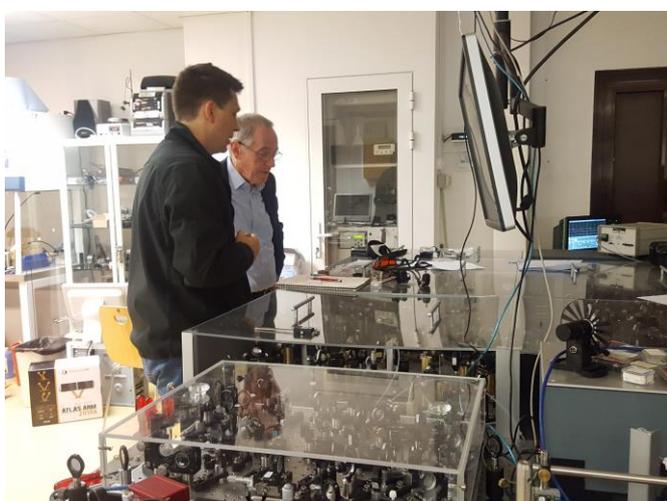


Meeting with PhD students, conference room, 2 October 2018

During this meeting with students from International PhD programme, Prof. Dainty gave a lot of examples from his life and led a discussion about scientific career development, based on his own diversified rich work experience and years he spent at the leading European universities. Among the discussed options were:

- postdoc positions: staying in Poland or going abroad,
- research or teaching - possible career paths,
- switching to industry – postdoc positions within R&D departments.

As an integrated part of the visit, Chris Dainty met with two representatives of synergistic teams, chosen by ERA Chair holder: Dr. Yuriy Stepanenko, the Laser Centre representative and R&D Director at Fluence, and Dr. Jan Guzowski, new group leader at the Department of Microfluidics and Complex Fluids. The aim of these laboratory visits was to familiarize Prof. Dainty with IPC PAS, establish contacts with synergistic groups supporting the ERA Chair holder team and discuss the possibility for future cooperation:



Department of photochemistry and spectroscopy, Laser Centre

Laser Centre Group is focused on development and exploration of experimental techniques to study ultrafast physical and chemical processes. Dr. Stepanenko presented numerous experimental systems, e.g. Yb: fiber femtosecond laser amplifier for micromachining applications and time-resolved Raman spectroscopy setup based on home-built femtosecond noncollinear optical parametric amplifier laser source.



*Department of Soft Condensed Matter,
Microfluidics and Complex Fluids Research
Group*

Microfluidics and Complex Fluids Group conducts research aimed at development of new techniques dedicated to guide the evolution of bacteria.

During a short visit, Dr. Jan Guzowski and Dr. Marco Costantini presented the research ideas they are currently developing, working on the behavior of droplets on a micro scale, dominated by surface tension forces and fluid viscosity.

The final part of the visit was dedicated to a meeting with general comments and observations of the guest regarding IPC PAS. Firstly, Prof. Dainty suggested to focus on two aspects of the PhD studies at the Institute:

- a) professional development, dedicated to soft skills, like presentation skills, career development, etc.
- b) technical skills related to general knowledge of PhD students. Besides being experts in narrow field, all students should be required to have a better general knowledge of Physics, Optics, etc.

Among general observations about the Institute with indication of areas for improvement, were:

- very high percentage of group leaders from the same mother institution vs. really diversified environment at the top international universities/research institutes;
- small number of international employees on the administrative posts;
- extra efforts to attract foreign group leaders / managers, while stressing the fact that Polish language is not mandatory to work at the Institute;
- due to the fact that there are no “see through” doors/laboratories, common space gives a feeling of isolation – it would be good to think about glass door, to support cooperation and positive work environment.



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ANNEX 1.

Full agenda of the visit



CREATE lectures

The Institute of Physical Chemistry of the Polish Academy of Sciences

Agenda: visit of prof. Christopher Dainty University College London

October 1, 2018

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|------------------|--|
| 11:00 – 12:00 pm | Meeting with the Director of IPC PAS, Prof. Marcin Opałło |
| 1:00 – 2:00 pm | IPC PAS Seminar – Prof. Christopher Dainty
<i>„Fundamental Limits of Mobile Phone Cameras”</i> |
| 2:00 – 3:30 pm | Lunch break |
| 3:30 – 5:30 pm | Lab visits
<i>Physical Optics and Biophotonics Group (POB), Department of Physical Chemistry of Biological Systems:</i> |
| 3:30 – 4:00 | Michał Hamkało |
| 4:00 – 4:30 | Julia Sudyka, PhD |
| 4:30 – 5:00 | Mounika Rapolu |
| 5:00 – 5:30 | Egidijus Aukorius, PhD |

October 2, 2018

- | | |
|-----------------|--|
| 9:30 – 10:30 am | Lab visits |
| 9:30 – 10:00 am | <i>Laser Centre, Department of photochemistry and spectroscopy - Yuriy Stepanenko, PhD</i> |



10:00 – 10:30 am	<i>Microfluidics and Complex Fluids, Department of Soft Condensed Matter - Jan Guzowski, PhD / Marco Costantini, PhD</i>
11:00 – 12:30 pm	Seminar – Prof. Christopher Dainty <i>„Should I stay or Should I go. Discussion on scientific career.”</i>
12:30 – 2:00 pm	Lunch break
2:00 – 4:00 pm	Lab visits <i>Physical Optics and Biophotonics Group (POB), Department of Physical Chemistry of Biological Systems:</i>
2:00 – 2:30	Patrycjusz Stremplewski, PhD
2:30 – 3:00	Łukasz Kornaszewski, PhD
3:00 – 3:30	Jakub Bogustawski, PhD
3:30 – 4:00	Piotr Ciąćka, PhD

October 3, 2018

10:00 – 12:00 pm	Lab visits <i>Physical Optics and Biophotonics Group (POB), Department of Physical Chemistry of Biological Systems:</i>
10:00 – 10:30	Paulina Niedźwiedziuk
10:30 – 11:00	Karol Karnowski, PhD
11:00 – 11:30	Jędrzej Solarski, PhD
11:30 – 12:00	Alejandra Consejo, PhD
12:00 – 2:00 pm	Lunch