

Curriculum Vitae Maurizio Fagnoni

PERSONAL INFORMATION

Family name, First name: FAGNONI MAURIZIO
Nationality: ITALIAN
Date of birth: 23-4-1968
URL for web site: <http://www-2.unipv.it/photogreenlab/>

• EDUCATION AND PROFESSIONAL POSITIONS

2008- Associate Professor - Department of Chemistry, University of Pavia
1998-2008 Researcher - Department of Organic Chemistry, University of Pavia
1996-1998 Researcher, Junior - Ronzoni Institute, Milan, Italy
1996 Post-Doctoral Fellow (attributed by the Ministry of Health, Rome)
1996 PhD - Department of Organic Chemistry, University of Pavia/Pavia, Italy and Organic Chemistry Institute, Westfälische Wilhelms-Universität, Muenster, Germany
1992 Master degree in Chemistry - Department of Organic Chemistry, University of Pavia/Pavia, Italy (110/110 cum laude)

In 2017, MF obtained the National Scientific Qualification (Abilitazione Scientifica Nazionale - ASN) for the role of Full Professor.

• INSTITUTIONAL RESPONSIBILITIES

2019- President of the Didactic Council in Chemistry, University of Pavia.
2013- Member of the scientific board of the Department of Chemistry, University of Pavia.
2013-2019 Member of the board of the Science Library, University of Pavia
2009- Member of the committee of the Italian Group of Photochemistry
2008- Director, PhotoGreen group, Pavia, recognized as one of the most productive groups in photochemistry in Europe.
2008-2012 Secretariat of the didactic council in Chemistry, University of Pavia.

• MEMBERSHIPS OF SCIENTIFIC SOCIETIES

2020- Member of the American Chemical Society
2010- Member of the Interdivisional group of Green Chemistry of the Italian Society of Chemistry
1999- Member of the European Photochemistry Association
1999- Member of the Italian Society of Chemistry

RESEARCH INTERESTS

The academic and professional background of MF (ORCID: 0000-0003-0247-7585) is in organic photochemistry, and since the beginning of his independent career, the activity has always been centered on the exploration of the photochemistry of organic molecules and the attending applications in various fields. The photochemical generation of intermediates is the main topic of his research.

As an example, phenyl cations were a virtually unknown class until 20 years ago and MF started the studies on their straightforward generation and application. In fact, irradiation in protic solvents of aryl halides did the trick and caused heterolytic cleavage to give phenyl cations. The reaction took place in the triplet manifold and led to the triplet cation, of high synthetic interest because of the diradical structure. This made possible addition to π -nucleophiles and metal-free arylation of alkenes, alkynes, aromatics could be carried out through this novel procedure. In his extensive exploration, MF has applied the reaction to a variety of ring substituted precursors, and devised different leaving groups, in particular esters, such as phosphates and sulfonates, easily prepared from phenols and thus offering a formal O-substitution of such easily available precursors as phenols.

Examination of the phenyl cation structure evidenced a further peculiarity. In the diradical structure of triplet phenyl cations the aromatic ring electronic structure was the same as that of aromatic radical cations, the formation of which MF studied during his PhD thesis, in particular for benzyl silanes and related derivatives. In such a way, the generation of an α , n -didehydrotoluene intermediate, a difficult to access but highly interesting species as anticancer agents was feasible under mild conditions. The originality of the approach was recognized by a CARIPLO Award for creativity for this research (two Nobel Prize winners in the Committee) and this hot topic was chosen by the University of Pavia for the crowdfunding campaign *Universitiamo*.

In a completely different field, MF developed the activation of C-H bonds in ethers, alkanes and amides and other organic derivatives, by interaction with a photoexcited catalyst.

MF contributed to develop a decatungstate anion as a catalyst active even with poor hydrogen donors such as alkanes and even under irradiation by sunlight, and the radicals formed are conveniently trapped by Michael acceptors with formation of a range of functionalized compounds via C-C bond formation. The examples above are all related to green chemistry, the contribution chemists are making to a more sustainable world. In fact, most of the processes just mentioned are clean and occur with no external energy supply nor supplementary reagent added, since the photon is either absorbed and causes the reaction, or, if not absorbed, leaves no residue behind. The development of appropriate "green" metrics demonstrates the environmental interest in the procedure developed.

Recently, MF designed suitable *dyedauxiliary groups* in order to introduce a structural motif that imparts both color and photoreactivity in an organic molecule. In such a way the amino group in anilines is converted to a colored, thermally stable yet photolabile moiety ($-\text{N}_2\text{SO}_2\text{R}$, via the intermediacy of unstable arene diazonium salts) that upon solar/visible light irradiation led easily to aryl radicals/aryl cations valuable intermediates in synthesis.

SCIENTIFIC PRODUCTIVITY

To date, MF has about 240 independent, international peer reviewed publications (*ca.* 125 publications in the last 10 years). Many have been published in first-tier international multidisciplinary journals, including *Angewandte Chemie* and *JACS* articles as well as *Chem. Sci*, *Chem. Eur. J.* and *JOC* (including one *Nature* paper). During the last five years the scientific output has been consistently around 11 publications per year, with an average IF of ≈ 6 (***h-index* = 46, total citations > 8300**, Scopus).

MF standing in the photochemistry area is emphasized by multiple invitations to write reviews, concept articles and books for internationally renowned publishers, all of which have been well received by the scientific community. MF most recent reviews/highlights in photocatalysis include: *Chem. Rev.* **2016**, *116*, 9850; *Chem. Soc. Rev.* **2013**, *42*, 97; *ChemCatChem* **2012**, *4*, 169; *Chem. Soc. Rev.* **2009**, *38*, 1999; *Chem. Rev.* **2007**, *107*, 2725. MF authored 21 book chapters covering the state-of-the-art of various aspects of organic photochemistry and he was likewise co-editor of the book *Handbook of Synthetic Photochemistry* (Wiley, 2010), co-author of the book

Photochemically-generated intermediates in Synthesis (Wiley, 2013) and co-editor of the book (tentative title: "*Photoorganocatalysis in Organic Synthesis*"; publisher: World Scientific Publishing Company; 2019).

MF has been invited to several Italian and international congresses and international schools. Selected invitation: "A. Corbella" Summer School (2009), Green chemistry lectures (Milan, 2015), European School of Medicinal Chemistry (ESMEC, Urbino, 2015), Photochemistry Gordon Research Conference (USA, 2015), Green Chemistry School (Verbania, 2015), CulturChem UPMC, (Paris, 2016), 2nd International Conference on Hydrogen Atom Transfer (iCHAT 2017, Rome), Italian Photochemistry Meeting (2017), 27th International Symposium on Photochemistry (2018), IV-China Italy Symposium Organic Chemistry (2019), VIII Ciamician Photochemistry School (2019), Annual meeting of the Japanese photochemistry Association (Nagoya, 2019). MF has also been invited as an external examiner for the PhD thesis at NUI Galway, Ireland (2012), Ferrara (2012), Milan (2014), Pavia (2015) etc.

• AWARDS

- 2019 "Elsevier Lecturship Award" from the Japanese Photochemistry Association
- 2018 "Methodological aspects in Organic chemistry" Prize from the Italian Society of Chemistry
- 2011 CINMPIS (National consortium for innovative methodologies and processes in synthesis) prize for "Innovation in organic synthesis", Italy
- 2011 "Exploration of new research frontiers - Award" from Cariplo Foundation (among others in the committee **Aaron Ciechanover**, -Nobel prize in chemistry, 2004 - and **Gerhard Ertl** -Nobel prize in chemistry, 2007).

• ORGANISATION OF SCIENTIFIC MEETINGS (amongst others)

- 2018 Central European Conference on Photochemistry, Bad Hofgastein, Austria (**Scientific committee**)
- 2017 I Giganti della Fotochimica, Bologna, Italy (**Organizing committee**)
- 2017 Italian photochemistry meeting, Perugia, Italy (**Scientific committee**)
- 2014 Organic chemistry day in Pavia, Pavia, Italy (Prof. D. MacMillan and M. Irie among the confirmed lecturers, **Organizer**)
- 2011 Meeting of the Italian group of photochemistry, Messina, Italy (**Scientific committee**)
- 2011 Green Chemistry, Safe Chemistry (2nd edition), Pavia, Italy (**Organizer**)
- 2010 Photochemical Sciences. A look into the future, (International conference on photochemistry), Ferrara, Italy (**Organizing committee**)
- 2009 Green Chemistry, Safe Chemistry, Pavia, Italy (**Organizer**)
- 2009 Fisphoton (International conference on photochemistry), Marseille, France (**Scientific committee**).
- 2006 Meeting of the Italian group of photochemistry, Pavia, Italy (**Organizer**)