

This message is in English and at the bottom in Italian

Dear doctoral students,

we are offering you the possibility to participate in a series of seminars given in the frame of the course Modern Trends in Chemistry, Industry, and Management for the master's degree in Chemistry.

Participation can be both in the presence as like as online. The general schedule is at the end of the message.

Almost all the seminars will be held by industrial researchers and they will present the perspective of the research from the industrial point of view, the direction of the reference market, and the hot point of the development in their specific sectors.

They will be a sort of windows, open to the industrial world, from the research to the strategy, from the objectives to the protections from concurrence. They will not be too specialistic so they can be very useful for doctoral and post-doctoral students from the scientific and technological areas. It is a unique chance you have to see what is happening in the industrial world and in which field you could apply for finding an interesting job.

They will be given in English and the access is free.

In agreement with the coordinators of your doctoral course, your participation will be accounted for in your didactic duty.

Instructions for attending:

Since September 27th, Seminars will be held every Tuesday (14.00 – 16.00) and Wednesday (11.00 – 13.00) respectively in room Speroni and room Jolles at the Department of Chemistry and will be online by streaming with Webex.

To access the streaming you have:

- 1) to go to Moodle: <https://e-l.unifi.it/>
- 2) Look for the course B0300750 (B234) Modern trends in chemistry, industry, and management, for the year 2022-23.
- 3) Register as a participant in the course (also if you attend only one lesson); the access is open, and no password is required
- 4) At the beginning of the folder of the course, you will find the connector for participating in the lesson in which you are interested.

Alternatively, I'll try to send at the beginning of each week, through the Doctoral secretariat, the remainder of the 2 seminars of the week, and the link and PW to directly connect to them.

I'll take care of the presence of the participants and I'll certificate them, for your didactic activity, at the end of the course. **For each seminar attended you will get 0,33 CFU.**

Cari dottorandi,

vi offriamo la possibilità di partecipare a una serie di seminari tenuti nell'ambito del corso Modern Trends in Chemistry, Industry, and Management per la laurea magistrale in Chimica. La partecipazione può avvenire sia in presenza che online.

Quasi tutti i seminari saranno tenuti da ricercatori industriali che presenteranno la prospettiva della ricerca dal punto di vista industriale, la direzione del mercato di riferimento e i punti caldi dello sviluppo nei loro settori specifici.

Saranno una sorta di finestre aperte sul mondo industriale, dalla ricerca alla strategia, dagli obiettivi alle protezioni dalla concorrenza. Non saranno troppo specialistici, quindi potranno essere molto utili per gli studenti di dottorato e post-dottorato delle aree scientifiche e tecnologiche. Si tratta di un'occasione unica per vedere cosa succede nel mondo industriale e in quale campo si potrebbe fare domanda per trovare un lavoro interessante.

Le lezioni saranno tenute in inglese e l'accesso è libero.

In accordo con i coordinatori del vostro corso di dottorato, la vostra partecipazione sarà conteggiata nel vostro dovere didattico.

Istruzioni per la partecipazione:

Dal 27 settembre i seminari si terranno ogni martedì (14.00 - 16.00) e mercoledì (11.00 - 13.00) rispettivamente nell'aula Speroni e nell'aula Jolles del Dipartimento di Chimica e saranno contemporaneamente online in streaming con Webex.

Per accedere allo streaming è necessario:

- 1) andare su Moodle: <https://e-l.unifi.it/>
- 2) cercare il corso B0300750 (B234) Modern trends in chemistry, industry and management, per l'anno 2022-23.
- 3) Registrarsi come partecipante al corso (anche se si frequenta una sola lezione); l'accesso è aperto e non è richiesta alcuna password.
- 4) All'inizio della cartella del corso, in uno dei primi argomenti, troverete il connettore per partecipare alla lezione a cui siete interessati.

In alternativa, cercherò di inviare all'inizio di ogni settimana, tramite la segreteria del Dottorato, il promemoria dei 2 seminari della settimana, e il link e la pw per collegarsi direttamente.

Mi occuperò della presenza dei partecipanti e la certificherò, per la vostra attività didattica, alla fine del corso. **Per ogni seminario frequentato si otterranno 0,33 CFU.**

Programma del Corso Modern Trends in Chemistry, Industry and Management a.a. 2020-21 della laurea magistrale in Chimica Advanced Molecular Sciences

Contact with scientific and educational reference person: andrea.caneschi@unifi.it

Lessons will be given in 2 different rooms of the Department of chemistry:

Aula Speroni, via della Lastruccia 13, Sesto Fiorentino

Room Jolles (ex-room 186) – Via della Lastruccia 3, Sesto Fiorentino

Doctoral students and post-docs can attend also online

First column:

Purple: live, but online in streaming projected in the classroom, with the presence of Prof. caneschi;

Pale blue: live in presence at room Jolles or Speroni at DICUS building; streaming will be also available.

Second Column:

Green: energy saving and energy by alternatives to the fossil fuel approach 6 Lessons

emerald: soft skills, very important in the industry world. 2 Lessons

Yellow: fuels by biomass transformations. 4 Lessons

Red: pharma world. 6 Lessons

Purple: materials. 5 Lessons

Massimo Chindemi	ENI	The technology leverage towards decarbonization:the priority areas for Eni's R&D	27-set Room Speroni at DICUS	mart	14:00-16:00	A strong acceleration in decarbonization represents the most important element to guide the world - and the energy sector in particular - along the trajectory outlined by a sustainable development scenario, according to the objective of the Paris Agreements. Decarbonization is a strategic priority for Eni which has as its goal zero net emissions from the upstream business by 2030 and net zero emission Scope 1+2+3 by 2050. Eni research has identified priority areas of high-impact technological development for the reduction and zeroing of CO2 emissions: some technological solutions are already under development, other are close to the industrial deployment.
Laura Zanibelli	ENI	IP strategy & valorization	28-set Room Jolles at DICUS	merc	11.00-13.00	In the framework of technological innovation into the industry, since the beginning of the idea generation up to industrial deployment of the technology, Intellectual Property (IP) strategy is mandatory to protect, manage and valorize patent portfolio and know how resulting from R&D projects and technological application, taking into account possible third parties' partnership, also through Open Innovation Model. A defined IP strategy, well aligned with business target, so contributes to strengthen and shorten the time to market of technology, especially crucial in the transition scenario, entering also with partners in different markets from the so called "business as usual" The focus of the lesson will regard the road map for IP strategy and valorization, to create value through intangible assets

Carlo Costa	ENI	IP protection: Patents and Freedom to Operate	4-ott Room Speroni at DICUS	mart	14:00- 16:00	<p>Innovation and R&D activities are essential to any Company willing to stay ahead in highly competitive and fast developing markets; Intellectual Property protection plays a key role in gaining, maintaining and defending competitive positions through the development of proper patentportfolios and active surveillance on the ability of exploiting technologies of interest by assessing their freedom to be operated.</p> <p>Patents and Freedom to Operate analyses representtwo main pillars in creatingvalue from innovation.</p> <p>Patent basics will be discussed, from the requirements of an inventionto a granted right, understanding the purpose and functioning of the patentlegal frame. The following topics will be debated:</p> <ul style="list-style-type: none"> - Inventions and patentabilityrequirements (novelty, inventive step, industrial application) - Patent competitive advantages - Patent Owner rights - Patent application structure - Filing, prosecution and granting of a patent application <p>Freedom to Operate (FTO) analyses will also be illustrated, focusing on the risks emerging from the exploitation of a new technology and how to handle them. The presentation will focus on:</p> <ul style="list-style-type: none"> - Patent infringement - Freedom to Operate purpose and meaning - Freedom to Operate phases and deliverables - FTO Risk management <p>The basic understanding of how patents work represents an important skill for anyone involved in innovation processes.</p>
Laura Meda	ENI	How the electrical energycan be stored?	5-ott Room Jolles at DICUS	merc	11.00- 13.00	<p>Electrical power generation is changing dramatically across the world because of the needto reduce greenhouse gas emissions and to introduce mixed and renewable energy sources. This seminar will provide a basic knowledge of main storage technologies, in orderto illustrate the advantages ofmain mechanical and electrochemical approaches with a focus on different kindsof rechargeable batteries.</p>

Daniele Bianchi	ENI	Biomass to biofuels: biochemical technologies	11-ott Room Speroni at DICUS	mart	14:00-16:00	<p>The seminar consists of two sections:</p> <p>1) a general introduction of the biofuel scenario, including the impact of transportation sector on the GHG emission, the policy to promote biofuels, the biofuels pros & cons, and the sustainable biomass feedstock availability.</p> <p>2) an overview of the most relevant biochemical technology to produce biofuels from biomass.</p>
Riccardo Po'	ENI	Fusion Energy	12-ott Room Jolles at DICUS	merc	11:00-13:00	<p>Nuclear fusion has the potential to afford abundant energy in a sustainable way, without emitting greenhouse gases and without producing long-lived radioactive wastes.</p> <p>In this lesson, the basic principles of nuclear fusion will be explained. Fusion will be compared with other energy sources and the scientific and technological aspects of fusion will be examined. Finally, the efforts of Eni in the field of magnetic confinement-based fusion will be illustrated.</p>
Aldo Bosetti	ENI	Biomass to biofuels: thermochemical technologies	18-ott Room Speroni at DICUS	mart	14:00-16:00	<p>Biofuel productions via thermochemical approach are illustrated in the presentation. Torrefaction, Pyrolysis, Hydrothermal Liquefaction and Gasification of biomasses are presented and discussed in term of main operative conditions, basic chemistry and status of technology (commercial or in progress). For every technology, the presentation offers an overview of possible reactor options together with present or potential utilization of the main product in the field of biofuels. Moreover, organic waste utilization as feedstock is highlighted.</p>

Gianni Girotti / Filippo Mantovani	Versalis /CEFIC	Bioeconomy in the Greenddeal and how to develop Bio-based products market / Bio-Based Products technologies developed by Versalis	19-ott Room Jolles at DICUS	merc	11.00-13.00	<p>Girotti: Market dimensions of Bioeconomy, its sub-sectors and specifically Bio-Based Products (BBPs) are discussed. BBPs drivers & barriers are described and analyzed in details, together with the actions really needed to develop the production and market of BBPs. A SWOT analysis is described based on the four aspects of BBPs development potential: Innovation and Technological readiness (I&T), Economic and Market potential (E&M), Social and Environmental impacts (S&E), Legal and Regulatory factors (L&R). Significant drivers and barriers from SWOT outcomes are then selected and highlighted and main actions to develop BBPs are then described with examples.</p> <p>Mantovani: The course describes the general concept of biorefinery through the analysis of several real cases; different green chemistry technologies in Versalis portfolio are described providing an overview of their production process and application fields of the bio-products. The analysis covers different market sectors where green chemistry is increasingly important: bio-fuels, bio-intermediates, bio-plastics and rubbers.</p>
Francesca Micoli	GSK	Vaccine technology platforms	25 ott Room Speroni at DICUS	mart	14:00-16:00	<p>Electrodeposition of alloys of industrial interest with low environmental impact with particular attention to the Galvanic industry. Morphological and compositional analysis of surfaces with Microscopic and Spectroscopic techniques. Preparation of modified surfaces for obtaining devices of technological interest. The lessons will try to develop the students' decision-making skills in the choice of the most appropriate surface techniques for the study of modified surfaces of technological and industrial interest.</p>
Federica Borsa / Gian Andrea Positano	Cosmeti caitalia	The Italian beauty industry: scenario, market and trends	26 ott Room Jolles at DICUS	merc	11.00-13.00	<p>Every day millions of men and women wash, make up, treat their body and hair, devoting more and more time to taking care of themselves. The cosmetic has become an irreplaceable element in our daily life and performs numerous functions, from the improvement of the physical aspect to the hydration, to the protection, to the perfume, to the detergency, to personal hygiene. All these functions have contributed to improving the lifestyle by increasing the quality and overall well-being. Cosmetics are part of our life. They contribute to our well-being and are precious allies of our health.</p> <p>The aim of this speech is precisely to tell the excellence of the Italian cosmetic industry: from the economic value of the sector to global level, to investments in research and</p>

					development (scientific value of cosmetics), to the attention towards sustainability and social responsibility (social value of cosmetics), to the professional opportunities it offers and to the interesting profiles that are emerging without forgetting the belonging of cosmetics to the excellence of Made in Italy. However, this is a little-known and poorly understood area. This will be the occasion to debunk false myths, clichés and lack of knowledge of cosmetics (many people do not know which products fall into this category).
Luisa Poggi	Bracco	Innovation in the pharmaceutical industry: the role of the research chemist in Bracco Imaging SpA	2 nov Room Jolles at DICUS	merc	11.00-13.00 Bracco Imaging SpA is a pharmaceutical company that acts as a worldwide provider of diagnostic imaging solutions. The company is committed to the discovery, development, manufacturing and marketing of imaging agents and solutions aimed at providing a better use and management in terms of diagnostic efficacy, patient safety and cost effectiveness. Bracco Imaging devotes considerable effort and substantial resources to research and development (R&D), in order to create and develop innovative products addressing unmet or poorly met medical needs. Another R&D goal is the conception and implementation of high-efficiency production processes with special attention to minimise their environmental impact. Bracco Imaging carries out its R&D activities in the Research Centers of Colletterto Giacosa (Ivrea, Italy) and Plan-les-Ouates (Geneva, Switzerland). As a pharmaceutical company, most of the R&D activities of Bracco are focused on chemistry: design and synthesis of new molecular entities, analytical characterization, process scale-up from kilolab to pilot plant up to industrial scale. However, R&D at Bracco Imaging is mostly based on finding new solutions by taking advantages of synergies between different fields of applied research: physicists work on imaging instrumentation to optimize the quality of the diagnostic techniques, biologists develop targeted contrast agents for specific pathologies, engineers design production plant with lower environmental impact. Multi disciplinarity is hence one of the core requirements in Bracco Imaging R&D, and the role of a pure chemist needs to be shaped accordingly. How, and to what extent, together with how the same situation can be translated into other pharmaceutical companies is what will be depicted in this lecture.
Giulio Assanelli /	ENI	Additives for Energy Saving	8-nov Room	mart	14:00-16:00 The lubricants are a mixture of base oils and additives, added to obtain the desired

<p>Marcello Notari</p>		<p>Lubricants with low Environmental Impact</p>	<p>Speroni at DICUS</p>		<p>performances in the finished products. The main classes of additives will be illustrated, principally those involved in the current technological evolution of lubricants. This evolution is directed towards products that contribute to improve the energy efficiency of engines and machineries, engine lubricants highly compatible with the aftertreatment devices (particulate traps and catalytic converters) and products deriving from bio-renewable sources. Some classes of innovative additives that have been developed and are being studied in our laboratories will be illustrated. These additives will allow to face the technological evolution of the sector and are in line with Eni's decarbonization strategy.</p>
<p>Thomas Pasini</p>	<p>ENI</p>	<p>The Green refinery roadmap: the Ecofining™ technology</p>	<p>9-nov Room Jolles at DICUS</p>	<p>merc</p>	<p>11.00-13.00 In December 2018, EU issued the Renewable Energy Directive called REDII, which gives a binding target of at least 32% of renewable energy in the EU within 2030, of which at least 14% coming from the transport sector. Eni reckons that a holistic and technology neutral approach, consisting of a synergistic mix of solutions, is required to achieve such reduction. The diffusion of electric transport, especially at an urban mobility level, will contribute significantly to the emission reduction target. However, it is still limited by many factors, such as the high price of vehicles, the limited autonomy of travel guaranteed by batteries and the lack of an adequate number of charging infrastructures. In this scenario, a new class of fuels with low environmental impact, called Liquid Low Carbon Fuel (LLCF), might represent, already in the short term, an effective alternative in the path towards the decarbonization of the transport sector. Given their compatibility with the Internal Combustion Vehicles (ICE) currently in circulation and thanks to their lower cost with respect to electric mobility, the LLCFs may contribute to the achievement of the 2030 EU target. In addition, in order to further promote these fuels, European tax revisions based on the fuel carbon intensity could be considered, as to increase the social acceptability and to reduce the selling price of the LLCFs respect to fossil fuels. In recent years, Eni has already developed two LLCFs called Eni Diesel + which is premium diesel fuel formulated with 15% Hydrogenated Vegetable Oil (HVO) produced in Eni's bio-refineries by means of the Ecofining™ technology, an innovative flexible hydrogenation process for the production of bio-distillates starting from bio-feedstocks. Eni is working to maximize the use of HVO in Eni Diesel + assuring a Well-to-Wheel CO2 reduction when compared to a fossil diesel.</p>

<p>Corrado Carretti</p>	<p>SAES Getter</p>	<p>“Innovation in action: theSAES Getters case”</p>	<p>15-nov Room Speroni at DICUS</p>	<p>mart</p>	<p>14:00- 16:00</p>	<p>In the rapidly changing global context, only innovation and diversification can allow promoting the growth of a company; innovation is therefore the fundamental asset for the long-term sustainability of the industrial ventures.</p> <p>The key point to innovate at the best is to have the right perception of the evolution of the external world, thus identifying the most promising technologies and markets, and to anticipate the possible obsolescence of proprietary expertise and products. Leverage both deep scientific knowledge and organizational skills appears the optimal strategy allowing to obtain the best achievements.</p> <p>This lesson describes some actual case studies concerning innovation in SAES, and will provide information about the differences between scientific research and applied research, the organizational and management issues to be solved, the possible innovation models to be applied and finally the skills and capabilities that scientists must possess to succeed in the industrial research.</p>
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Massimo Innocenti	Università di Firenze	Electrodeposition and surfaces analysis in the Galvanic industry – Part 1	16-nov Room Jolles at DICUS	merc	11.00-13.00	Electrodeposition of alloys of industrial interest with low environmental impact with particular attention to the Galvanic industry. Morphological and compositional analysis of surfaces with Microscopic and Spectroscopic techniques. Preparation of modified surfaces for obtaining devices of technological interest. The lessons will try to develop the students' decision-making skills in the choice of the most appropriate surface techniques for the study of modified surfaces of technological and industrial interest.
Mauro Giusti	Eli Lilly	Chemistry graduates in the pharmaceutical industry - testimonials from Eli Lilly	22-nov Room Speroni at DICUS	mart	14:00-16:00	The activity of the Eli Lilly company will be presented by a director of the company. Two junior researchers will present their research activities inside the Sesto Fiorentino plants. A discussion on the more suited profiles preferred by the company will be illustrated as like as an overview of the formation of personnel provided inside Eli Lilly will be presented.
Ernesto Roccaro	ENI	Hydrogen, a new energy vector: grey, green or blue	23-nov Room Jolles at DICUS	merc	11-13	An overview of the perspective of H2 in the Energy Transition, with focus on production. The European Green Deal puts the EU on a path to climate neutrality by 2050, through the deep decarbonisation of all sectors of the economy, and higher greenhouse gas emission reductions for 2030. This objective presents several challenges and it will require a radical transformation not only in how we generate, but also how we distribute, store, and consume energy. Hydrogen is destined to play a key role as clean and efficient fuel, as long as its production shifts from conventional high-polluting “grey” to more environmental friendly “blue” and “green” hydrogen production methods.
Dario Pasini	UniPV	Organic Photovoltaics	29-nov Room Speroni at DICUS	mart	14:00-16:00	The lecture will deliver an overview, together with the key concepts, related to the use of organic photovoltaics technology (OPV). Over the past few years, the organic photovoltaics technology (OPV) has reached remarkable power conversion efficiencies (PCEs), mostly thanks to the advent of nonfullerene acceptors as well as to a high level of materials engineering. The lecture will start with an introductory section, in which the OPV technology will be put into the context of the other emerging photovoltaic technologies. It will be followed by a second section, in which the fundamentals and the working mechanism of the OPV cells will be rationalized. The third section will deal with the currently used materials, but it will also give an overview of the materials developed over the years. The final outlook section will put the OPV technology into the context of future potential market applications.

Francesca Micoli (GSK)		Electrodeposition and surfaces analysis in the Galvanic industry – Part 2	6-dic Room Speroni at DICUS	mart	14:00-16:00	<p>Despite the success of vaccination in the last decades, there are still many infectious diseases in need of a vaccine, especially in LMICs, where multiple barriers, scientific, regulatory and economic, have so far prevented the effective deployment of vaccines that target even the most common infectious diseases.</p> <p>Use of technology platforms can facilitate vaccine development and their implementation in LMICs. Synergy of the different technologies currently available and their advancement will enable the tailored design of improved vaccines for existing and novel targets, expanding the number of available vaccines and tackling currently unmet medical needs.</p> <p>Two technologies for the development of bacterial vaccines will be discussed more in depth: glycoconjugation and Generalized Modules for Membrane Antigens (GMMA).</p>
Luca Contiero	Cromology	Architectural coatings industry: chemistry, process and innovation	7-dic Room Jolles at DICUS	merc	11.00-13.00	<p>The seminar will give a wide overview of Cromology Italia as part of international group focused on development and production of coating for decorative applications. It will explain the technical basics of coating technologies with some specific focus on their properties, chemistry and industrial process typically in place in production plants, and involving mainly pigment based products. It will also explore the main figures and functions involved in a structured innovation approach actually in place in Cromology Italia, and some important elements regulating legal aspects of new developments such as industrial know-how, intellectual property, confidential information exchange.</p>
Silvia Trasciatti (Galileo Research)		Research and development in the pharmaceutical industry: preclinical and clinical stages. The Galileo Research experience	13-dic Room Speroni at DICUS	mart	14:00-16:00	<p>The development of a new drug to treat an illness is long, costly, highly risky and uncertain. Pharmaceutical R&D demands a wide range of expertise: science, regulations, business, economics. On average, it takes 10-15 years and costs \$2.6 billion to develop one new medicine, including the cost of the many failures, depending on the therapeutic area, treatment modality and disease complexity. Only 12% of new molecular entities that enter clinical trials eventually receive marketing approval.</p>

						Major reasons for drug failure are: lack of clinical efficacy, toxicity, poor drugability, lack of medical needs.
Francesco Bertocchi (Nanesa)		Graphene and its derivatives: industrial fabrication and technological applications	14-dic Room Speroni at DICUS	mart	11:00-13:00	The speech will be focused on the italian startup Nanesa. The company will present different GRM production process (Graphene Related Materials) and the development of different commercial grades. Many research activities related to the development of Industrial applications, based on GRM @ different TRL will be presented too.