



Chemical Society Annual Report to the EuCheMS Division of Chemical Education for 2019¹

1. Abstract.

In 2018/19, the Division of Chemical Education of the Italian Society of Chemistry participated in chemical education activities in Italy and abroad.

During this period the Division promoted the creation of educational research groups in the various Italian Regions. Teachers of various school orders were invited to contribute with their own experience and to share good practices in teaching/learning of scientific disciplines and, in particular, of Chemistry, aiming to:

1. analyze and discuss the results of international (OECD-PISA) and national (INVALSI) tests for the identification of teaching and learning difficulties in master key subjects at all school levels;
2. propose new models for innovative teaching methodologies of Science and Chemistry; encourage discussions on how actively engage students. The challenge is to convey the key concepts of chemistry in a way that the teachers can efficiently engage the students, demonstrate the relevance of chemistry to their lives, so to enable them to place science appropriately within their imagined futures. This work is carried out in the various school ages trying to combine the psycho-pedagogical, as well as disciplinary, aspects.
3. discuss and eventually apply, new education policy.

The Italian Society of Chemistry is taking care of the organization of conferences, workshops, schools and seminars: the participation is open to all interested in the activities. Usually participants range within 30 and 50 persons. Some members of the division of chemistry participated in conferences abroad; cooperation within universities, secondary schools and industry is encouraged and financially supported within the frame of the national Program: Piano Lauree Scientifiche. The Division of Chemical Education of the Italian Society of Chemistry participated in the realization of chemistry teachers' courses and in the organization of students' local competitions aiming to the selection of the participants in the International Chemistry Olympic competition.

¹ July 2018- June 2019, all levels of chemistry education: primary, secondary schools, universities , LLL, general and vocational education.

2. National educational policy

It is possible to access to the most recent documents of the Ministry of Education, Research and University (MIUR) for primary schools, for the secondary and tertiary education in the following urls:

http://www.indicazioninazionali.it/documenti_Indicazioni_nazionali/indicazioni_nazionali_in_fanzia_primo_ciclo.pdf

http://hubmiur.pubblica.istruzione.it/web/istruzione/prot7734_12

Secondary Education

New secondary school (licei):

http://nuovilicei.indire.it/content/index.php?action=lettura_paginata&id_m=7782&id_cnt=10497

http://archivio.pubblica.istruzione.it/normativa/2007/allegati/all1_dm139new.pdf

Tertiary Education

Core Chemistry for Bs students: the document published in 2007 has been reviewed and reappraised by ConChimica (<http://sites.unica.it/conchimica/offerta-formativa/>). The introduction of some new topics for professional curricula is under consideration and a committee with persons representative of all disciplines and stakeholders (Federchimica and Ordine dei Chimici) is working on it.

During the master degree eligible courses of chemical education (Didattica Chimica) have been introduced in all chemistry curricula; the course has minimum 6 credit points, i.e. 25 hours work per credit point.

3. Events in chemical education

The Italian Society of Chemistry has completed the accreditation process, as qualification body for the education of teachers and it is now possible for the teachers to pay the fees using the contribution that is assigned every year to those teachers that have successfully reached the objectives established at the beginning of year.

4. Activities of the National Chemical Society

National Conference

The Division of chemistry education (Divisione di Didattica) will organize the National annual meeting in Bologna by the end of 2019

Scuola Permanente per l'Aggiornamento degli Insegnanti di Scienze Sperimentali (SPAIS)

The event is organized by Università di Palermo since 2009 and it is organized in the frame of a collaboration between: Ufficio Scolastico Regionale of Sicily, Chemistry teachers Association (AIC), Association for the Teaching of Physics (AIF), the National Association of Natural Sciences Teachers (ANISN) and the Division of Chemistry Education of the Italian Society of Chemistry (DDSCI). Prof. Antonio Floriano is the reference person of SPAIS.

SPAIS 2019. The summer school is organized this year in Agrigento (Sicily) from July 22 to 27, 2019. The theme is "Models in Science". The mission of the school is to provide the results of the scientific and technological progresses together with the possible didactical approaches. The school is open to all secondary level science teachers.

The URL: http://www1.unipa.it/flor/spais_2019.htm is reporting all information.

SPAIS 2018. It was hold from July 23rd to 28, 2018 focused on "Messaggi di Scienza". Teachers were acknowledged of 32 hours of continuing education.

All information is given in: http://www1.unipa.it/flor/spais_2018.htm

National School on Chemical Education Research at University "Ulderico Segre"

The XI School of Chemical and Research Education "Ulderico Segre" will take place September 2nd to September 4th 2019, in San Miniato (PI). National experts of Chemical Education will present the results of the courses of chemical education available for the master students in almost all Italian universities; the flyer is available at the link: https://www.soc.chim.it/sites/default/files/users/sci_didattica/Brochure%20Segre%202019.pdf

The **X edition** of the School "Scuola di Didattica e Ricerca Educativa "Ulderico Segre"" was organized in Roma from September 5th to September 8th 2018 at Villa Benedetta in Roma.

The school was focused on the three-year education, placement and internship program (FIT) and pre-FIT program and on the New National Competition for Secondary school Teachers. It was open to researchers, associate professors and tenured professors of the Italian Universities and to those high-school teachers who might be involved in FIT and pre-FIT activities.

The III National School on Chemical Education "Giuseppe Del Re" for teachers will take place from September 4th to September 7th 2019 in San Miniato (PI). The main topic will be "Chemical reactions": the school will address disciplinary topics as well as ethical and social aspects linked to the use of "chemical products" in the every day life.

The second edition of Scuola "Giuseppe Del Re" di San Miniato 2018 was held from September 10th to September 13th, 2018.

- **Workshop "L'alfabeto della natura: la Chimica per la Formazione Primaria"** will be organized in Roma from November 15 to November 16th 2019.

Italian Chemistry Olympiad

Participation in the realization of chemistry teachers' courses and students local competition aiming to the selection of the participants in the International Chemistry Olympic competition (<https://www.soc.chim.it/sites/default/files/Invito%20GdC%202018-2019.pdf>).

5. Publications

DDSCI publishes five issues per year of a journal **Chimica nella Scuola** with didactical and pedagogical discussions, publication of tested demonstrations and hands-on experiments for students. The journal Chimica nella Scuola (CnS) covers the full range of experimental and theoretical research on the teaching and/or learning of chemistry. It is relevant for everyone involved with the teaching of chemistry in schools, colleges and universities. It is aimed at disseminating knowledge and contributing to the discussion of new ideas and didactical experience. CnS was established in 1979 and electronic formats of archival content are free available from 1997 to the present (<https://www.soc.chim.it/riviste/cns/catalogo>).

The journal also offers a Discussion Forum for the exchange of views especially on contentious topics. Reports from International Bodies and on Italian Legislation and Norms, on books and meetings, as well as News and Announcements provide current information.

La Chimica nella Scuola - Contacts:

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The access to the issues of the last two years is only allowed to the SCI members with username and password, which are sent upon the payment of the annual fee.

Books:

1. Antonella Maria Maggio and Roberto Zingales – Appunti di Storia della Chimica – 2019, Aracne Editrice:
<http://www.aracneeditrice.it/index.php/pubblicazione.html?item=9788825522419>
2. Fabio Olmi and Eleonora Aquilini – La Chimica a Scuola – 2019 PM Edizioni Collana Albatros:
<https://www.ibs.it/chimica-a-scuola-dalla-riflessione-libro-fabio-olmi-eleonora-aquilini/e/9788899565046>
3. Margherita Venturi "L'avventura del progetto Irresistibile - Insegnanti, studenti ed esperti a confronto su temi di ricerca d'avanguardia e aspetti della Ricerca e Innovazione Responsabile nei curricula scolastici", Bonomia University Press, Marzo 2018.

6. Liaison with the chemical industry

The Chemical education division sponsors the National prize of Federchimica for Young students (Premio Nazionale Federchimica Giovani per l'Anno scolastico 2017-2018) and it disseminates it in all schools. The public competition is only open to the students of the secondary school (first cycle) who can describe their vision on Chemistry. The text can be written by single students or by a group. They can make an interview, a short video or a presentation. The proposed topics are: Life without Chemistry? ("Vivere senza chimica?") – Chemistry as solution and as problem ("La chimica è una soluzione e non un problema") – Find the fake! ("Trova la bufala!"). The winner will have a Tablet for single student and 2.000 euro for books etc. for the school. All information are provided at the link: [linkhttp://federchimica.it/la-chimica-per/scuola/scuola-secondaria-di-primo-grado/premio-federchimica-giovani-2017-2018](http://federchimica.it/la-chimica-per/scuola/scuola-secondaria-di-primo-grado/premio-federchimica-giovani-2017-2018)

The deadline was March 16th 2018.

International and European initiatives

Piano Lauree Scientifiche is a national priority program started in 2005 and still on going. The project aimed at establishing a cooperation among Schools, University and Industries for increasing the interest and enrolments in scientific disciplines and for maintaining and improving the high quality standards of science teaching at high schools and technical schools. It supports teacher training, school-based projects in chemistry and cooperation between schools, research institutions, universities and chemical industry. Teachers of high schools together with researchers of the Universities envisioned laboratory experiments designed so that the students learn chemistry through a so-called working knowledge. Teachers participated in the first phases of the project by designing and executing the experiments together with the researchers on topics that represent the state-of-the-art in science. They also provided an adequate support to the preparation of the students during their lessons. Industries collaborated so far to a minor extent but whenever possible they offered visiting possibilities for classes and /or seminars in the schools.

<https://www.pianolaureescientifiche.it/>

and old site: <http://www.progettolaureescientifiche.eu/>

PLS regional chemistry reference persons, with persons representatives of Ufficio Scolastico Regionale and of DD-SCI aim to design the requisites that students should possess for the admission to Chemistry and Science curricula; and to develop a national program for the orientation of the students of the last two classes of secondary schools. The programme includes the cooperation with the high-school teachers and the organization of seminars and workshops on various topics for continuous education in Chemistry.

7. Other events and activities

Collaboration with **SIRD** (Società Italiana di Ricerca Didattica) and various teachers associations for the organization of the workshop **“Didattica e saperi disciplinari. Atto II”** which was held from March 15th to March 16th 2018 at the department of Scienze della Formazione dell’Università degli Studi Milano Bicocca.

Participation in **“Si .. geniale!”**, promoted by Caript in Pistoia last 5 Maggio 2018, with the presentation of the works carried out in the three order of school of the town: “Giardino delle invenzioni” (3-5 maggio 2018).

Participation to “Festival della Scienza” in Genoa from October 25th to November 4th 2018 e on **“Cambiamenti”**.

Collaboration in the organization of **Festival ScienzaSocietàScienza** on Science and Resources held in Cagliari from November 8th to November 13th 2018.

This year the Festival will take place on 7-12 November with seminars, performances, exhibitions and workshops for 6 days of science:

<https://www.italybyevents.com/en/events/sardinia/cagliari-festivalscienza/>

8. Name of delegate and deputy

Prof. Antonella Rossi and Deputy is Prof. Liberato Cardellini

9. Contact details of delegates. Please give as much detail as possible. Only the name of your institution and your telephone number will be given on the website.

Prof. Antonella Rossi

Chair of Analytical Chemistry

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10. CV of delegate.

Antonella Rossi is tenured professor of analytical chemistry at the Università di Cagliari (Italy) since 2001. She studied Chemistry at the University of Cagliari and she graduated in 1981. She is co-author of 182 papers (165 being in Scopus and WoS databases). Main research interest is Surface Functionalization and Characterization by XPS, AES and ToF-SIMS with applications to Corrosion and Tribology.

She is involved in the ISO SC 201 and in the accreditation of Chemistry Bs, Master and Doctoral courses as Coordinator of the Italian committee for ECTN certification. Since 2015 she is also representing Italy in the IUPAC Chemical Education Committee.

More information is available at the link: <http://people.unica.it/antonellarossi/>