

Curriculum Vitae

INFORMAZIONI PERSONALI

Nome EUGENIO
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FORMAZIONE TITOLI

Laurea in Chimica presso l'Università di Palermo il 23/6/72.

Ha trascorso periodi più o meno lunghi presso il Department of Chemistry - University of Tennessee; in Società quali l'Italtel e l'Eni ed in laboratori di ricerca quali: l'Oak Ridge National Laboratory (U.S.A.), il Brookhaven National Laboratory (U.S.A.) ed il Rutherford Appleton Laboratory (U.K.). il Berlin Neutron Scattering Center, Helmholtz-Zentrum Berlin, (Germany), il Laboratoire Léon Brillouin, Saclay, (France).

ATTIVITA' DIDATTICA

Nel corso degli anni ha svolto a vario titolo: il corso di Fisica presso la Facoltà di Medicina e Chirurgia ed i corsi di Termodinamica Chimica, Chimica Fisica dei Fluidi, Termodinamica Statistica, Laboratorio di Chimica Fisica I, Chimica fisica IV, Elementi di Chimica Fisica, Laboratorio di Chimica Fisica IV, Sintesi di Sistemi Nano-strutturati, Caratterizzazione di Sistemi Nanostrutturati, Tecniche di Analisi Strumentale con Esercitazioni di Laboratorio C.I. Modulo: Tecniche di analisi spettroscopiche, Chimica Fisica dei Sistemi Micro-eterogenei del Corso di Laurea in Chimica; i corsi di Struttura atomica e Spettroscopia Molecolare, Metodologie di Indagini Microscopiche non Distruttive del Corso di Laurea in Scienze e Tecnologie per i Beni Culturali; i corsi di Metodologie di Indagini non Distruttive, Metodologie di Indagini Chimico Fisiche del Corso di Laurea in Conservazione e Restauro dei Beni Culturali.

Ha inoltre insegnato nell'ambito del Master "Esperto Nanotecnologie per i Beni Culturali" organizzato dall'Università degli Studi di Palermo e del Master in "Sistemi di Diagnostica dei Beni Culturali" organizzato dal Parco Scientifico e Tecnologico della Sicilia S.c.p.a., dal Centro per la protezione ambientale e l'analisi dei materiali (CEPA s.r.l. -Palermo) e dall'Istituto Superiore di Ricerca e Formazione sui Materiali Speciali per Tecnologie Avanzate (ISIRIM S.c.a r.l.-Terni).

Dal 2007 al 2010 è stato presidente del Corso di Laurea in Scienze e Tecnologie per i Beni Culturali, con sede operativa a Petralia Soprana (Pa).

Ha tenuto lezioni al "III Corso Intensivo di Colloidi, Interfasi e Tensioattivi: Sintesi Proprietà ed Applicazioni" (Assisi, 1981), alla "IV Scuola di Spettroscopia Neutronica: diffusione dei neutroni dalla materia dura" (Palau Sassari 1998), al "Seminario Nazionale di Chimica Fisica Materiali Funzionali" (Torino 1999), al "Seminario su Sintesi, Struttura e proprietà chimiche e fisiche dei materiali nanofasici" (Cagliari 2001), alla "Residential Summer School ECTN Working Group on Chemistry and Cultural Heritage" (Thessaloniki 2006), alla "3° Residential Summer School ECTN Working Group on Chemistry and Cultural Heritage" (Thessaloniki 2009), alla 4th Intensive School on Conservation Science (Teruel, Spain, 2010) ed alla 5th general edition tenutasi alla Marmara University, *Istanbul* (Turkey, 2011),

alla 1st Thematic Intensive School on Mortars & Fibrous Materials (Fez 2011), 1st Thematic School on Metallic Materials (Genoa 2011), Winter Intensive School on Conservation Science (Marrakesh 2011), 3rd Thematic Intensive School on Conservation Science (Castellon 2012), 6th General Intensive School on Conservation Science (Evora 2012), 4th Thematic Intensive School on Conservation Science (Alcora 2013).

Ha organizzato: la "3^a Scuola del Gruppo Italiano Microonde Applicate ai Materiali ed ai Processi" (Palermo 2006); la "Chemistry and Conservation Science 2nd Residential Summer School" (Palermo 2008).

RICERCHE FINANZIATE

Dal 1985 è stato titolare di fondi di ricerca MPI 60%, e dal 1990 è stato titolare di fondi di ricerca CNR e MIUR ed altra tipologia.

Ha partecipato a diversi grandi progetti di collaborazione nazionale e internazionale.

È stato titolare di progetti di collaborazione internazionale CORI e COOPERLINK e del P.O.R. Sicilia 2000-2006 (misura 3.15 azione C quota regionale).

Attualmente è responsabile di una unità operativa del PRIN09 "Applicazione delle microonde ad alcune sintesi inorganiche e all'estrazione di composti bioattivi e oli essenziali "e di POR FESR Sicilia 2007-2013, Misura 4.1.1.2 e Misura 4.1.1.1.

INCARICHI / CONSULENZE

Dal 1994 al 1998, ha fatto parte del Comitato di Consulenza per le Scienze Chimiche del CNR e della Giunta della Società Italiana di Spettroscopia Neutronica.

Dal 1994 al 1999 ha fatto parte della Commissione per la Spettroscopia Neutronica del CNR.

Dal 2000 al 2003 ha fatto parte del Direttivo della Divisione di Chimica Fisica della Società Chimica Italiana.

E' inoltre responsabile scientifico del Centro Grandi Apparecchiature (<http://www.unipa.it/cga>) del Sistema di Laboratori di Ateneo (UniNetLab <http://www.uninetlab.unipa.it/>) dell'Università di Palermo.

Nel 2009 ha fatto parte del panel di valutazione del CNR.

E' membro del Comitato di Label ECTN e membro del Pool di esperti del Dottorato Chimica Eurolabel ®.

ASSOCIAZIONI SCIENTIFICHE

Società Chimica Italiana.

Gruppo GIMAMP.

ECTN

PUBBLICAZIONE

1) Ion pair association in isodielectric mixtures at 25°C.

A. D'Aprano, I.D. Donato and E. Caponetti.

J. Solution Chem., 3, 371-376 (1974).

- 2) Conductance of tetrabutylammonium nitrate, bromide and picrate in butyronitrile-butanol mixtures at 25°C.

A. D'Aprano, I.D. Donato and E. Caponetti.

Annali di Chimica, 66, 185-192 (1976).

- 3) Molecular interactions in liquid alcohol-water system. Refractive indices and densities of water with n-propanol, n-butanol, n-pentanol and n-hexanol at various temperatures.

A. D'Aprano, I.D. Donato, E. Caponetti and V. Agrigento.

Gazz. Chim. Ital., 108, 601-605 (1978).

- 4) The static dielectric constant of solutions of water in n-alcohols at 15, 25, 35, and 45°C.

A. D'Aprano, I.D. Donato and E. Caponetti.

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- 5) Viscosity studies of solution of water in n-aliphatic alcohols at various temperatures.

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J. Solution Chem., 8, 793-800 (1979).

- 6) Associazioni molecolari nelle miscele idroalcoliche.

A. D'Aprano, I.D. Donato, E. Caponetti and R. Triolo.

**"Rendiconti della 2a Conferenza Scientifica Triennale" Comitato
e di Struttura della Materia. p. 487-494 (1982).**

Regionale per le Ricerche Nucleari

- 7) Small-angle neutron scattering (SANS) studies of single and double tailed surfactants in solutions.

L.J. Magid, C.A. Martin and E. Caponetti

Proc. of the 1984 Scientific Conf. on Chem. Defence Research.

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Center, Aberdeen Proving Grounds, Maryland (1985).

8) Small-Angle Neutron Scattering Study of Alkyl Polyoxyethylene Sulfate Micelles. Sodium n-Dodecyl-(Oxyethylene)₂ Sulfate in D₂O and in D₂O/H₂O Mixtures at 25°C.

E. Caponetti and R. Triolo

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- 9) Small-Angle Neutron Scattering Study of Alkyl Polyoxyethylene Sulfate Micelles. Effect of the Polyoxyethylene Groups on n-Dodecyl-Poly Oxyethylene Sulfate in D₂O/H₂O Mixtures at 25°C.

R. Triolo, E. Caponetti and V. Graziano.

J. Phys. Chem., 89, 5743-5749 (1985).

- 10) Preliminary Small-Angle Neutron Scattering experiments on magmatic rocks to detect critical phenomena.

G. Lucido, E. Caponetti and R. Triolo.

Miner. Petrogr. Acta, XXIX, 133-138 (1985).

- 11) SANS Study of Alkyl Polyoxyethylene Sulfate Micelles. Sodium Dodecyl-(Oxyethylene)₄ Sulfate in D₂O at 25°C.

R. Triolo and E. Caponetti.

J. Solution Chem., 15, 377-386 (1986).

- 12) Small-Angle Neutron Scattering from hexadecyltrimethylammoniumbromide

micelles in aqueous solutions.

S.S. Berr, E. Caponetti, J.S. Johnson, L.J. Magid and R.R. Jones.

J. Phys. Chem., 90, 5766-5770 (1986).

- 13) Small-Angle Neutron Scattering from water-in-oil microemulsions.

E. Caponetti, L.J. Magid, J.B. Hayter and J. S. Johnson, jr.

Langmuir, 2, 722-731 (1986).

- 14) Sodium p-alkylbenzenesulfonate: a Simple and Fast Characterization by Electron Impact Mass Spectrometry.

P. Agozzino, L. Ceraulo, M. Ferrugia, E. Caponetti, F. Intravaia and

R. Triolo.

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- 15) A Small Angle Neutron Scattering Study (SANS) of Micellar Structure and Growth of a Straight Chain Benzenesulfonate. Comparison with an Isomeric Branched Chain Surfactant.

E. Caponetti, R. Triolo, P.C. Ho, J.S. Johnson, jr., L.J. Magid.,

P. Butler and K.A. Payne.

J. Coll. Interf. Science, 116, 200-210 (1987).

- 16) Small-Angle Neutron Scattering Study of Alkyl Polyoxyethylene Sulfate Micelles. Effect of chain length.

E. Caponetti, R. Triolo and J. S. Johnson, jr.

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17) Static SANS Measurement on Concentrated water in oil Microemulsion.

E. Caponetti and L.J. Magid.

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18) Small-angle neutron scattering from aqueous solution of C12E6 and C12E8: critical fluctuation and micellar growth.

L.J. Magid, R. Triolo, E. Caponetti and J. S. Johnson, Jr.

Surfactant in Solution vol.4 p.155-178 K.L. Mittal and P. Bothorel Editors, Plenum Publishing Corporation (1987).

19) Fractal approach in petrology. Small-Angle Neutron Scattering experiments with volcanic rocks.

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Phys. Rev. B, 38, 9031-9034 (1988).

20) Effect of surfactant neutralization on hexadecane / water /1-pentanol / oleic acid / ethanolamine microemulsion. - A SANS study.

E. Caponetti, W.L. Griffith, J.S. Johnson, jr, R. Triolo and A.L. Compere.

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21) Micellar Growth and Overlap in Aqueous Solutions of Hexadecyl-octyldimethyl Ammonium Bromide: A Fluorescence Quenching and Small-Angle Neutron Scattering Study.

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Langmuir, 4, 813-817 (1988).

22) Static Small-Angle neutron scattering on concentrated microemulsion:

The particular case of potassium oleate.

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Chester Editors, Plenum Publishing Co. London New York (1989).

23) Analysis of small-angle scattering patterns from precipitating alloys.

R. Triolo, E. Caponetti and S. Spooner.

Phys. Rev. B 39, 4588-4591 (1989).

24) Effect of Composition on Sizes of W/O Ethanolamine-Oleic acid

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E. Caponetti, A. Lizzio, R. Triolo, A.L. Compere, W.L. Griffith and

J.S. Johnson, jr.

Langmuir, 5, 357-363 (1989).

25) Uso dei frattali in petrologia: esperimenti di scattering di neutroni ai bassi angoli su rocce magmatiche.

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- 26) Small-Angle Neutron Scattering from Commercial Li-Al Alloys.

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Philosophical Magazine, A 60, 401-414 (1989).

- 27) Correlation Spectroscopy in Molten and Superculed Antimony Trichloride.

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- 28) Analysis of the full Small-Angle Scattering Curve of Al-Li Alloys.

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- 29) Application of Small-Angle Neutron Scattering to Micellar Fluid.

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- 30) SANS Study of W/O n-Hexadecane, Potassium Oleate, Water and $C_nH_{2n+1}OH$

($n = 5, 6, 7$ and 8) Microemulsion: Effect of Water Concentration.

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31) Fractality as a working tool for petrology: small-angle neutron scattering experiments to detect critical behaviour of magma.

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32) Kinetics of Particle Growth and Particle Composition of a Commercial Al-Li Alloy by Means of Small-Angle Scattering.

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33) Small-Angle Neutron Scattering from System of Interacting Particles. Modelling High Density Micellar Fluids.

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35) Structural study of micellar solutions and microemulsions by Small-Angle Neutron Scattering.

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- 36) Analysis of small-angle scattering patterns from a commercial Al-Li alloy by means of a model incorporating a repulsive step potential.

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- 37) Alcohol partition in a Water-in-Oil Microemulsion from Small-Angle Neutron Scattering.

E. Caponetti, A. Lizzio, R. Triolo and J.S. Johnson, jr.

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- 38) Dodecyltrimethylammonium Bromide in water-urea mixtures. Structure and energetics.

E. Caponetti, S. Causi, R. De Lisi, M.A. Floriano, S. Milioto and R. Triolo.

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- 39) Phase stability of dense charged and uncharged hard sphere multicomponent fluid mixtures.

C. Caccamo, M. Varisco, M.A. Floriano, E. Caponetti and R. Triolo.

J. Chem. Phys. 98, 1579-1587 (1993).

- 40) Long time annealing at ambient temperature of a mildly treated commercial Al-Li alloy.

E. Caponetti, M.A. Floriano, G. Pipitone and R. Triolo.

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- 41) On the shape of radii distribution function of a monodispersed ellipsoidal scatterers assembly.

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- 42) Fluorinated, Protonated and Mixed Surfactants Solution: a Small-angle Neutron Scattering Study.

E. Caponetti, D. Chillura Martino, M.A. Floriano and R. Triolo.

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- 43) Molecular association of cryptand 221D in NaCl-water solutions. A small-angle neutron scattering Study.

E. Caponetti, D. Chillura Martino, M.A. Floriano and R. Triolo.

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- 44) Effetto di macrocicli sulla struttura micellare di dodecilsolfato di sodio e bromuro di dodeciltrimetilammonio: studio SANS

E. Caponetti, D. Chillura Martino, M.A. Floriano, R. Triolo.

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- 45) Spinodal and nucleation as indicators of magmatic conditions.

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- 46) Small-angle scattering from phase-separated metallic alloys: from experiment to phase Diagram.

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and R.G. Jordan Eds., Kluwer p. 83-92 (1994)

- 47) Effect of Crown Ether 1,4,7,10,13,16-esaoxa-cyclooctadecane on the Structure of Sodium Dodecylsulphate and Dodecyltrimethylammonium Bromide Aqueous Micellar Solutions

E. Caponetti, D. Chillura Martino, M.A. Floriano, R. Triolo and G.D. Wignall.

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- 48) Two length scale structure in some computed-generated aggregates grown by diffusion-limited aggregation

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- 49) On the nature of phase separation in a commercial Aluminium-Litium alloy.

M.A. Floriano, A. Triolo, E. Caponetti and R. Triolo.

J. Molec. Struct. 383, 277-282 (1996)

- 50) Small Angle Scattering Study of the structure of Isotactic Polypropylene/Oligo (Ciclopentadiene) Blends.

E. Caponetti, D. Chillura Martino, S. Cimmino, M.A. Floriano,

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- 52) Quasi-elastic light scattering in polymer-containing microemulsion.

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- 53) Localization of n-Alcohols and Structural Effects on Aqueous Solutions of Sodium Dodecylsulphate.

E. Caponetti, D. Chillura Martino, M.A. Floriano, and R. Triolo.

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- 54) Alcohol partition in a water in oil microemulsion: Small-Angle Neutron Scattering Contrast Measurements.

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57) Thermodynamic instability in self-organized critical magmatic fluid as the origin of earthquakes.

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61) FT-IR and Dielectric Study of Water/AOT Liquid Crystals.

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65) Molecular association of a non ionic and a ionic induced surfactant: cryptand (221D) NaCl in water.

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Langmuir 19, 554-558 (2003)

66) Synthesis, size control and passivation of CdS nanoparticles in water/AOT/n heptane microemulsion.

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AMBITI DI RICERCA

Dal 1982 si è dedicato allo studio della determinazione delle proprietà strutturali dei sistemi come le soluzioni micellari e microemulsioni utilizzando diverse tecniche sperimentali, tra cui il scattering di neutroni a basso angolo (SANS). Nel 2004 inizia un'attività rivolta alla caratterizzazione chimico-fisica del patrimonio culturale, come i materiali cellulosici, legni archeologici, materiali metallici (Rostro romano di Acqualadrona, il guerriero di Petralia Sottana), ceramiche, ossa archeologici, resine e vernici di strumenti musicali. L'attività ha anche interessato lo Sviluppo di metodi e prodotti per la conservazione dei BB.CC, come Nanocalci e Gel per la pulitura di superfici pittoriche.

Negli ultimi anni, in collaborazione con gruppi di ricerca accademici e industriali, è interessato alla sintesi e caratterizzazione di nanomateriali, sintesi di mesoporosi e di nanoparticelle in microemulsione, preparazione di compositi polimerici. Per la caratterizzazione strutturale utilizza diverse tecniche come scattering di raggi X a basso angolo, la microscopia elettronica a trasmissione e a scansione, risonanza magnetica nucleare allo stato solido, varie tecniche spettroscopiche e altre tecniche convenzionali.

Attualmente si interessa dei seguenti argomenti:

- Sviluppo di sintesi di nanoparticelle di CdS in microemulsione
- Influenza delle microonde sulla sintesi di nanoparticelle
- Studio delle proprietà strutturali e ottiche di nanoparticelle di YAG drogato con terre rare preparate mediante co-precipitazione, Pechini e in microemulsione
- Preparazione di nanocompositi polimerici a base di polimetilmetacrilato e policarbonato
- Preparazione di silice mesoporosa MCM-41 funzionalizzata con ossidi di Mn, Nd, Ce e eteropoliacidi per applicazioni catalitiche
- Funzionalizzazione di nanotubi di carbonio a parete multipla
- Preparazione di nanoplatelets di grafene