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## 14. Paolo Galli

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## Personalities in Polymer Science



Paolo Galli

Few personalities have influenced polymer technology and science to the extent as has Paolo Galli. He is one of the most successful scientists and businessmen in polyolefins, and, he is, in addition, the acknowledged leader in polypropylene. Under his guidance and imagination entirely new processes and products were invented, developed and produced.

Paolo Galli was born on August 29, 1936 as the first of three sons of Carlo Galli and Vittoria née Nanni in the province of Vicenza in Bassano del Grappa, which is located in the Alps of Northern Italy. Carlo Galli, his father, was a colonel in the Italian Army and later became an Industrial Manager. Vittoria was a teacher of French and German literature. The Galli family has deep roots to Florence in Tuscany, Italy that go back to the year 1200, to Doctor Giulio Galli, the "Magnificent". Paolo went to Elementary School (from 1942–1947), Middle School (from 1947–1950) and the Scientific Lyceum in Bassano del Grappa from which he graduated in 1955.

In 1956 Paolo Galli enrolled in the University of Padova; he studied Industrial Chemistry at the Faculty of Science. In 1961, he received his doctoral degree in Industrial Chemistry under the guidance of Professor Giovanni Semerano with a thesis entitled "Polymerization of Vinyl Chloride at Low Temperatures".

He subsequently won the Italian Employer's Federation competition award which allowed him to study in the laboratory of a major Italian company. He chose Montecatini and joined the Hydrocarbon Research Institute. Galli received a degree in Polymer Technology working on the "Development of New Polymerization Technologies based the Ziegler-Natta Catalysis" under the guidance of Professor Natta.

Since first joining Montecatini, Paolo Galli pursued his industrial career with great success but always kept in touch with academic life in Italian Universities and foreign scientific institutions. For the next 35 years he was, in part, associated with academia. From 1962 to 1965 he was an Adjunct Professor at the University of Bologna, teaching physical chemistry, chemical kinetics and Industrial chemistry. Since 1965 Paolo Galli has been closely associated with the Faculty of Science of the University of Ferrara where he held an Adjunct Professorship in Industrial Physical Chemistry from 1965–1973. From 1973–1983 he was Associate Professor and since 1984 he has held the Chair of Macromolecular Chemistry at the University of Ferrara.

In the late 1980's, Paolo Galli conceived the idea of creating the International School of Advanced Studies in Polymer Science in Ferrara, a unique mechanism of cooperation between Industry and Academia. Paolo Galli was the Director for three years after its creation in 1989.

From 1968 to 1975 Paolo Galli supervised basic research and process development for catalysts, ethylene-propylene rubber, high density polyethylene, polypropylene and crystalline ethylene-propylene copolymers. He made major contributions to the discovery of the revolutionary use of magnesium chloride based catalysts for polyethylene. He also was a major contributor for the "reactor granule technology".

In 1975, the Division of Petrochemicals, of Montedison, the successor company of Montecatini was divided and the Division of Plastics Materials was created with Italo Trapasso as its President. This development necessitated a complete reorganization of the Division and, in 1976, Paolo Galli was appointed Director of Research in Ferrara with a team of 550 including scientists and supporting staff. This allowed him to streamline the research organization and completely redirect its operation. Galli

assigned a large task force one third of his working team to concentrate on the development of better, more efficient and ultimately, more cost efficient catalysts, catalysts that could be used in such minute amounts that they could be left in the polymers without any detrimental effects.

Within one year of Galli's appointment, the "High Yield Catalysts" (alta resa) for polypropylene were discovered which gave Montedison a dominant role in the production and sales of polypropylene. In joint activities with Mitsui Petrochemicals in Japan the polyolefin business was revolutionized and made polypropylene the polyolefin with the highest growth rate and the polymer that challenged engineering plastics in most applications. In his capacity, Paolo Galli initiated and directed basic research into new processes and products. Most prominent was the discovery and development of the world dominant position for Montedison in the polymerization processes Spheripol, Spherylene, Catalloy and Hivalloy, which were based on breakthroughs in "Reactor Granule Technology".

In 1980, Paolo Galli was responsible for naming the Research Center in Ferrara in honor of Giulio Natta under whose direction at the Politecnico in Milan, polypropylene had been discovered. A monument depicting the structure of isotactic polypropylene is now located in Ferrara in front of the Research Center.

From 1983 to 1984 Paolo Galli spent one year in Milan and managed the Special Product and Polymer Division of Montedison and the next year he became the Managing Director of Dutral SpA, the newly established company within Montedison responsible for specialized elastomers, engineering thermoplastics, high performance materials and high yield Ziegler-Natta catalysts.

During this time, the polypropylene part of Montedison was joined with the polypropylene activities of Hercules under the name of Himont. In 1985, Paolo Galli assumed the position of Executive Vice President of Technology, located in Wilmington, DE. In 1989, he became Managing Director of Montedison Research while continuing as Vice President at Himont. From 1991 to 1995 Paolo Galli held the following positions: Corporate Director of Montedison Research, President of Montecatini Technology S.R.L./Spherylene, President of CSI-Montedison Applied Research,

## Columns

President of Orion Advanced Chemical Research SpA, a Member of the Board of Directors, Himont SpA, and a Member of the Board of Directors, Tecnimont SpA.

In 1995, a new company, Montell, was created by the fusion of Montedison, Himont Montecatini Technology/Spherylene and Shell companies. Paolo Galli was appointed President of Montell Technology.

During his scientific career, Galli has published over 200 scientific papers, several books and is the holder of 35 patents. Paolo Galli was and is also in high demand as a plenary and main speaker in major International conferences.

In 1995, he received the "Outstanding 1995 Achievements Award" of the Plastic Materials, Division of the American Plastic Engineers Society". In 1996 he was cited for "outstanding contribution in development and commercialization of New Polyolefins". In 1996, he received the special award "Federico Bernagozzi" and the Free Honorary Lectureship at the "International University" Studiorum Superiorum PRODEO. In 1997, he was awarded the "Knight of Sacro Romano Impero" and the "Knight of Tau of San Giacomo di Altopascio". In 1998, he was elected "Member of the Academy of the Georgofili" and in 1998, he received the Herman F. Mark Medal.

Since Paolo was a child he has been deeply involved with nature and is a lover of the outdoors. He has been an active skier, jogger and, most importantly, scuba diver.

While pursuing these interests and his diving in the North Adriatic sea off-shore of Aquileia, he found many Roman amphoras and found eventually an entire Roman ship of the 2nd century filled with amphoras. He also has found many Roman Imperial coins "Sesterzi" in Ostia Antica.

Paolo Galli has also been interested in natural forms of many descriptions, from minerals, to stones and to fossils. He was and is particularly fascinated by the "perfect spherical shapes". This interest led him ultimately to significant inventions in the polymerization of propylene. He recognized that it was important that the catalysts for

propylene polymerization have a spherical shape. In addition the catalyst particles must break up under polymerization conditions and the entire polymer granule retains the shape of the original parent catalyst particle and the final polymer particles maintain the desired high bulk density of polypropylene. This invention and innovation needed the full understanding of polymer generation and growth on the heterogeneous catalyst and ultimately led to the creation of the classification "Catalyst Architecture".

Not only is Paolo Galli interested in antiquity and antiquities such as his interest in old maps, old clocks, watches and numismatics, but he is also an expert in gourmet delicacies. In Summer and Fall he can be seen, with his wife, looking for "delicious porcini mushrooms". Coming from Bassana del Grappa, he is also a world expert of *Grappas*, the distillate from the fermentation of the residues of grapes.

In 1964, Paolo Galli married Anna Maria Marcon: They share their interests in archeology, arts, classical music and nature especially their enthusiasm of mountaineering in the Dolomiti mountains.

The Galli's have one daughter Giulia and two sons: Stefano and Massimo. Giulia has a M.S. in classic literature with specialization in ancient numismatics and archeology. Stefano received a B.E. from the University of Delaware in Industrial Engineering and an M.B.A. from the Wharton School of Philadelphia. He is now working with Merrill-Lynch in New York. Massimo graduated in International Economics from Georgetown University of Washington; he then earned a law degree from Columbia University and is now working for Toger and Welts, an American Law Firm, located in New York and London.

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\*A column co-ordinated by Charles A. Wilkie, Marquette University.