Santiago Calatrava was born in Benimámet, an old municipality now integrated as an urban part of Valencia, Spain. Calatrava attended primary and secondary school in Valencia. From the age of eight, he also attended the Arts and Crafts School, where he began his formal instruction in drawing and painting. When he was thirteen, his family took advantage of the recent opening of the borders and sent him to France as an exchange student. Upon completing high school in Valencia, he went to Paris with the intention of enrolling in the Ecole des Beaux-Arts; but as he arrived in June 1968 during a period of student boycotts, he found his plan was unworkable.

He returned to Valencia and enrolled in the Escuela Tecnica Superior de Arquitectura, a relatively new institution, where he earned a degree in architecture and took a post-graduate course in urbanism. While at the school, he also undertook independent projects with a group of fellow students, bringing out two books on the vernacular architecture of Valencia and Ibiza.

Attracted by the mathematical rigor of certain great works of historic architecture, and feeling that his training in Valencia had given him no clear direction, Calatrava decided to pursue post-graduate studies in civil engineering and enrolled in 1975 at the ETH (Federal Institute of Technology) in Zurich. In 1981, after completing his doctoral thesis, "On the Foldability of Space Frames", he started his architecture and engineering practice. It was during this period that he met and married his wife, who was a law student in Zurich.

**CAREER**
After completing his studies, he took on small engineering commissions, such as designing the roof for a library or the balcony of a private residence. He also began to enter competitions, believing this to be the most likely way to secure commissions. His first winning competition proposal, in 1983, was for the design and construction of Stadelhofen Railway Station in Zurich, the city in which he established his office.

![Fig. 1 Railway Station Stadelhofen, Zürich, Switzerland.](image)

Calatrava's early career was dedicated largely to bridges and train stations, the designs for which elevated the status of civil engineering projects to new heights. In 1984, Calatrava, designed and built the Bach de Roda Bridge in Barcelona. This was the beginning of the bridge projects that established his international reputation.

Among the other notable bridges that followed were the Alamillo Bridge (see Fig.2) and Cartuja Viaduct, commissioned for the World's Fair in Seville (1987-92); the Campo Volantin Footbridge in Bilbao (1990-97); the Alameda Bridge and Metro Station in Valencia (1991-95); and Lyon Airport Station (1989-94). He started, a very large cultural complex and urban intervention in Valencia, in 1991, the City of Arts and Sciences, to which Calatrava buildings are still being added.
Other large-scale public projects from the late 1980s and 1990s include the BCE Place Galleria in Toronto (1987-92), the Lyon-Saint Exupery Airport Railway Station, Satolas, France (1989-94), and the Oriente railway station in Lisbon (1993-98, commissioned for Expo' 98).

His elegant and daring **Montjuic Communications Tower in Barcelona**, Spain (1991) in the heart of the 1992 Olympic site was a turning point in his career (see Fig.3). Aside from its distinctive structural form, the tower is innovative in enclosing the circular platform of microwave dishes. The overall form of the tower is based on a sketch (made by Calatrava) of a kneeling figure making an offering. The orientation of the tower means that the shadow of the central needle on the circular platform acts as a sundial. The Quadracci Pavilion (2001) of the Milwaukee Art Museum was his first US building. Calatrava’s entry into high-rise design began with an innovative 54 story high twisting tower, called **Turning Torso** (2005), located in Malmö, Sweden (see Fig.3).
Calatrava is currently designing the future train station - World Trade Center Transportation Hub - at Ground Zero in New York City.

Calatrava’s style has been heralded as bridging the division between structural engineering and architecture. In this, he continues a tradition of Spanish modernist engineering that includes Félix Candela and Antonio Gaudí. Nonetheless, his style is very personal and derives from numerous studies he makes of the human body and the natural world.

**Calatrava as sculptor**

Calatrava is also a prolific sculptor and painter, claiming that the practice of architecture combines all the arts into one. In 2003, the Metropolitan Museum of Art in New York City held an exhibition of his artistic work, entitled "Santiago Calatrava: Sculpture Into Architecture." Exhibitions of his work have also taken place in Germany, England, Spain, Italy and elsewhere.

Projects completed
The projects completed by him include the following:

- Trinity Bridge, footbridge over River Irwell, Salford, England, 1995
- Oberbaumbrücke, Berlin, Germany 1896 and rebuild and opened on the 9th November 1994
- Alameda Bridge and metro station, Valencia, Spain
- 1983-1984, Jakem Steel Warehouse, Munchwilen, Switzerland
- 1983-1985, Ernsting Warehouse, Coesfeld, Germany
- 1983-1988, Wohlen High School, Wohlen, Switzerland
- 1983-1990, Stadelhofen Railway Station, Zürich, Switzerland
- 1983-1989, Lucerne Station Hall, Lucerne, Switzerland
- 1984-1987, Bac de Roda Bridge, Barcelona, Spain
- 1984-1988, Barenmatte Community Center, Suhr, Switzerland
- 1986-1987, Tabourettli Theater, Basel, Switzerland
- 1987-1992, BCE Place (atrium), Toronto, Canada (see Fig.5)
- 1989-1994, TGV Station, Lyon, France
- 1992, Puente del Alamillo, Seville, Spain
- 1992, Puente de Lusitania, Mérida, Spain
Fig. 5. Interior of the BCE Place Galleria, Toronto, Canada (1992).

- 1992, Montjuic Communications Tower at the Olympic Ring, Barcelona, Spain
- 1992, World's Fair, Kuwaiti Pavilion, Seville, Spain
- 1994-1997, Campo Volantin Footbridge, Bilbao, Spain
- 1996-2009, *Ciutat de les Arts i les Ciències*, Valencia, Spain

Fig. 6 *L'Umbracle* at the Ciutat de les Arts i les Ciències in Valencia, Spain (1996)
Fig.7 The Hemispheric at the Ciutat de les Arts i les Ciències in Valencia, Spain (1996)

- 1996, Centro Internacional de Ferias y Congresos de Tenerife, Santa Cruz de Tenerife (Santa Cruz de Tenerife (province), Tenerife, Canary island, Spain)
- 1998, Estação do Oriente or (Gare do Oriente), Lisbon, Portugal
- 1998, Puente de la Mujer, in the Puerto Madero barrio of Buenos Aires, Argentina
- 2000, New terminal at Bilbao Airport, Bilbao, Spain

Fig.8 Milwaukee Art Museum, Milwaukee, Wisconsin, U.S.A.
• 2003, James Joyce Bridge, bridge over River Liffey, Dublin, Ireland
• 2003 Auditorio de Tenerife, the architect’s first performing arts facility, Santa Cruz de Tenerife, Spain (see Fig.4)
• 2004, redesign of Athens Olympic Sports Complex, Athens, Greece
• 2004, Sundial Bridge at Turtle Bay, Redding, California, USA
• 2004, Three bridges (called Harp, Cittern and Lute) spanning the main canal of the Haarlemmermeer, Netherlands
• 2004, University of Zurich, "Bibliothekseinbau" library remodelling, Zürich, Switzerland
• 2005, The bridge connecting the Ovnat shopping mall and the Rabin Medical Center (Beilinson) in Petah Tikva, Israel
• 2005, Turning Torso, Malmö, Sweden(Fig.3)
• 2007, 3 Bridges on the A1 Motorway and TAV Railway, Reggio Emilia, Italy
• 2008, Chords Bridge at the entrance to Jerusalem, Israel, a light rail bridge
• 2008, Ponte della Costituzione footbridge from Piazzale Roma over the Grand Canal, Venice, Italy

Among the projects now nearing completion are the Quarto Ponte sul Canal Grande, Venice, Italy; Liege Guillemins TGV Railway Station, Liege, Belgium; the Palacio de Congresos, Oviedo, Spain; and a Light Rail Train Bridge in Jerusalem, Israel.
Calatrava opened an office in New York City in 2004 (having closed the Paris office in 2003) in order to be closer to a number of important recent commissions in the United States. These include the World Trade Center Transportation Hub in New York; three bridges over the Trinity River in Dallas, Texas; a new music center for the Atlanta Symphony Orchestra in Atlanta, Georgia; and the **Chicago Spire**, a residential tower which will be the tallest building in the Western Hemisphere when it is completed.


Other projects in design and construction elsewhere in the world include Campus Buildings and Sports Center, Maastricht, The Netherlands; Serreria Bridge and Agora, Valencia; and the Citta della Sport, Rectorate and campus master plan for Roma II University in Tor Vergata, Italy; 130m pedestrian bridge to span the Bow River in Calgary, Alberta, Canada.

**Honors and Awards**

His awards are numerous. They include the following:

- the August Perret Prize from the Union Internationale d'Architectes (UIA) in 1987;
- the 1988 IABSE Prize from the International Association of Bridge and Structural Engineering;
- the Gold Medal of the Institute of Structural Engineers, London (1992);
- Creu de Saint Jordi from the Generalitat de Caatalunlya, Barcelona, Spain (1994); Medalla de
Oro al Merito de las Bellas Artes from the Ministry of Culture in Granada, Spain (1996);

- Officier de l'Ordre des Arts et Lettres from the Republic of France (1998);
- Premio Príncipe de Asturias de las Artes in 1999; the 2000 Medalla de Oro of the Circulo de Bellas Artes, Valencia;
- The Sir Misha Black Medal, Royal College of Art, London (2002);
- the 2002 Leonardo da Vinci Medal from SEFI (Societe pour la Formation des Ingenieurs);
- the 2004 Gold Medal from the Queen Sofia Spanish Institute, New York;
- the 2005 AIA Gold Medal from the American Institute of Architects;
- the 2005 Eugene McDermott Award in the Arts from the Council for the Arts at M.I.T.; and
- 2005 Premio Nacional de Arquitectura from the Spanish Government.

Many individual Calatrava projects have been honored by professional societies, publications and governmental entities.

Santiago Calatrava was named a "Global Leader for Tomorrow" by the World Economic Forum in Davos, Switzerland (1993) and one of the "Time 100" most influential people by Time Magazine in 2005. He has received 15 honorary doctorates to date and is a Permanent Honorary Guest (Standiger Ehrengast) of the University of Zurich.
There has been much criticism of Calatrava’s work on the airport in Bilbao, Spain, and in many ways this project crystallizes the most frequently expressed views. The airport is essentially art that is impractical for the day-to-day activities for which it was built. The airport lacks adequate facilities and the tiles and glass break under local weather conditions. A planning oversight that is mysterious for one who has extensive training in the area of engineering.

Despite an influential presence within the European architectural community, Calatrava has rarely designed a totally enclosed building. Rather, most of his creations are open structures.

Though the bridge, "Canal Grande", for the Municipality of Venice, was commissioned in 1996, it was completed only in 2008. It is because it underwent numerous structural changes, due to the mechanical instability of the structure; also the excessive weight of the bridge, would have caused the bank of the canal to fail. In 10 years the project was inspected by more than 8 different consultants and the cost went up to three times the original expectations.

See Also:

- http://www.calatrava.info/