Title: Light and innovative fiber technologies, as inspiration for future Fashion

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Light and innovative fiber technologies, as inspiration for future Fashion

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Abstract
Technological development has brought many changes to our lives, not only in the different way we live our daily lives but also in our way of dreaming and seeing the future.
The textile companies that produce intelligent fabrics and nanotechnology with its interactivity make us live and feel different. The radical changes of this millennium have also influenced the way in which fashion designers create their clothes or their creations. The same also applies to architects, who see textile materials as a way to recreate living spaces or even create temporary spaces with a flexible material, which can create a temporary home which also reduces costs.
If well before the technological era, clothes were created to have a communication code, or a way to stand out in society, now this is not enough, clothes are created above all to have their own echo personality, which also makes us stand out . The discovery of chemical fibers has profoundly modified the traditional conception of designing fabrics. The fundamental properties of cotton and wool are immutable, static. It is the technology of the spinner, the weaver, the textile ennobler that must adapt to this changeability by trying to create something new. Chemical fibers and their polymers, on the other hand, can be produced with properties tailored to each specific need. It can be said that until yesterday fabrics were manufactured and processed; today they are designed with precise purposes at a structural level. Matter becomes 'intellectualized', the terms 'material' and 'invention' overlap. For this reason, all the companies that produce and experiment with new textile materials have and will have a great influence on the creations that will come because the fabric already comes out of the company with its own functionality, it is that functionality, it is that functionality, it is that it is functionality, it is that functionality.

The beginning of the 20th century.

Between the end of the nineteenth century and the beginning of the twentieth century, a patrol of scientists opened the way to a new knowledge of the world: And the era of Maxwell, Hertz, Planck, Einstein, Thomson. The distance between science and its technological applications tends to disappear. A new figure of scientist is emerging who has a completely new attitude to the mathematical abstractness of the conception of the world, draws the consequences of scientific achievements, translates them into applications, brings science into everyday life. It is in this period and thanks to this new attitude that man-made fibers were born and developed.
Tracing the prehistory of natural textile fibres, the first finds that testify to their use by man date back to around 5,000 BC. It therefore took 7,000 years of civilization to arrive at the "patent for artificial silk", in 1884.
It is in this period and thanks to this new attitude that man-made fibers were born and developed.
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Fig.1/ 1/a James Clerk Maxwell, 1/b Heinrich Rudolf Hertz, 1/c Karl Ernst Ludwig Marx Planck, 1/d Albert Einstein Ulm, 1/e Joseph John Thomson

added to the synthetic family... starting a chain of explorations, which led man-made fibers to represent, in the new millennium, over 60% of global textile consumption and more than 75% of European ones. In 2001, for the first time, the most used fiber in the world will be polyester, no longer cotton. This acceleration in consumption has its now well-known motivation in the "designability" of man-made fibres, that is, in their ability to evolve and innovate, foreseeing and interpreting not only the needs of processors and consumers, but also the "spirit of the times". And this is already a good demonstration of "intelligence".

In the 1950s, fibers were advertised to the general public with means worthy of consumer products. The need for a brand is created.

The philosophy with which the fibers approached the market at the beginning was that of modernity, of 'easy care', with a great push to replace and imitate natural fibers in all possible uses.

In the 1960s and early 1970s, fibers entered the world of fashion and discovered the most imaginative applications in yarns and fabrics, thanks to aesthetic and design research carried out by the style centers of large producers, which for for many years they acted as a guide to the textile industry, already established in the world for creativity and good taste. The concept of imitation and substitution soon proved to be harmful because it inevitably led to the offer of products that were not suited to the needs of the consumer, and often lost in comparison with natural fibres, as they did not respond to the intrinsic application potential of the individual man-made fibres. in relation to the end uses (terrifying nylon shirts or irrational waterproofs in

acrylic made their appearance in those years). The concept of partnership was outlined and developed, more or less in the same period, also under the pressure of the counter-offensive of natural fibres, whereby man-made fibers were combined with wool, cotton, linen or silk to improve their performance, increase their durability and facilitate maintenance. Attention to comfort was also accentuated and, at the same time, safety was also rediscovered as a value to which fibers could contribute, with the development of 'flame retardant' types. These are the years that also mark the strong emergence of acrylic in fashion and sports knitwear and polyester in tennis shorts.

The 70s followed with great changes in the discovery of new fibres, and part of this change in development was due to the first oil crisis. If Europe was previously the exporter of fibres, now

[1] *James Clerk Maxwell (1831 - 1879) The famous Scottish physicist, who discovered the theory of electromagnetism and forever changed our views on the nature of light*

[2] *Heinrich Rudolf Hertz (Hamburg, 22 February 1857 – Bonn, 1 January 1894) was a German physicist. He was the first to demonstrate the existence of electromagnetic waves with an apparatus of his own construction, the Hertzian dipole, capable of emitting radio waves . In honor of him, in the international system the frequency is measured in hertz.*

it becomes the importer, and the countries that had oil are transformed into new countries that develop and produce the new fibres. Thus the substitution of synthetic fibers for natural ones has slowed down. At the same time the lifestyle and fashion of the moment also changes, everyone becomes against everything that is plastic, and the natural is favored. Jeans are back in fashion, and everything that is handmade. In this climate of changes, other developments develop and are created, no longer in the way of creating new fibers but in the way of developing the fibers that had been created up until then. The fundamental properties of cotton and wool are immutable, static. It is the technology of the spinner, of the weaver of textile ennoblement that must adapt to this immutability, trying to create something new. Chemical fibres, on the other hand, are dynamic and can be designed according to different needs. This means that the basic characteristics can be modified according to the results you want to achieve, with long-lasting effects, not susceptible to changes due to use and washing precisely because the modification is made in the structure of the fiber itself. Nylon, for example, changes its characteristics when it must be used to make tires or underwear or bulletproof vests while still remaining nylon. Their programmability is the fundamental success of chemical fibers, because we always try to develop them according to our needs.
In the 80s the most used word was "micro", the continuous process of refinement of the titles led to the birth of microfibres, whose use and image dominated the market for a long time, further accentuating comfort and giving birth to classes of totally new. The basic concept that was thus established was that of overcoming: certainly not imitation, but not just partnership anymore, which however remains an acquired value. Research had finally developed fibers with characteristics that went "beyond natural", allowing the creation of finished products with hitherto impossible performances, which offered decisive solutions for a
better quality of life. And we shouldn't just think about clothing which, particularly with sportswear becoming increasingly functional and hi-performance, has affected consumer lifestyles; or to furnishings, finally safe, long-lasting and even more beautiful and comfortable.
It is necessary to consider the enormous development of the sector of so-called technical uses: from non-woven structures for geotextiles to those for medical use, from textiles for means of transport to construction, from protective clothing to filtration systems. In recent years, society has fallen in love with the cult of the body and the high-tech look. Gore-tex is born, waterproof and breathable fabrics and heat-sealable polyester pods are born, fabrics that minimize the air resistance coefficient (cx) and help to break speed records, microfibre fabrics that have allowed Reinhold Messner to survive in Antarctica, polyester 'fleece' fabrics replacing sweatshirts. From the first developments for sportswear, comfort has always been developed and sought in a fabric and fabrics have been created that have the ability to act and transform according to man's bodily needs. The ability of a fabric to maintain a constant body temperature despite changes in external temperature is not the consequence of the composition of its fibres, natural or synthetic, but exclusively of how the fabric was constructed. The most effective thermal insulation is in fact the air that warms up due to its proximity to the body. For this to happen, the structure of the fabric must be such as to 'store' a sufficient quantity of air and, above all, capable of blocking it in very small 'cells' between which it cannot move too freely. Even in this case of technological development it is still nature that helps to create, for example if we study the behavior of birds, when it is very cold they inflate their feathers, increasing the volume of air trapped between the feathers. The greater

[3]Karl Ernst Ludwig Marx Planck, known as Max (Kiel, 23 April 1858 – Göttingen, 4 October 1947) He created the quantum theory, which together with Albert Einstein's theory of relativity is one of the pillars of contemporary physics.
[4]Albert Einstein Ulm, 14 March 1879 – Princeton, 18 April 1955 Demonstrates the validity of Planck's quantum theory through the photoelectric effect of metals; he provides a quantitative evaluation of Brownian motion and the randomness hypothesis of the same; he expounds the theory of special relativity, which precedes that of general relativity by about a decade.
[5]Joseph John Thomson (Cheetham, 18 December 1856 – Cambridge, 30 August 1940) was a British physicist. He is known for discovering the negatively charged particle: the electron.

quantity of air that penetrates between the feathers, even if it is cold, quickly warms up thanks to the heat that emanates from the bird's body and works as a thermal insulator.
The existence of a microclimate between skin and fabric is essential for comfort. The lack of microclimate between fabric and skin causes the humidity emitted by the body to condense on site and this creates an adhesion force between fabric and epidermis which makes the garment extremely unpleasant, whatever the fiber that makes it up. The fabrics must be made in such a way as to retain the ability to create this microclimate in contact with the body even after repeated washing with water or dry cleaning. The different movements that we make during the day cause our body to produce different quantities of humidity. For this reason, when you make a big physical effort and sweat a lot, it is preferable to use fabrics made with fibers that have a lower absorption capacity but better transport characteristics, i.e. that do not soak up sweat but transfer it more quickly from the skin to the environment as do polyester, polyamide, acrylic and polypropylene. The fact that synthetic fibers are better than natural ones is only due to the fact that synthetic ones can be produced in desirable length and natural ones have the limitation of the length of the fiber, and for this reason that when weaving with natural fibers they can have more difficulty in having a compact and clean fabric during weaving, however with synthetic fibers these difficulties do not exist due to the unification that the fiber presents.
The word that represents the 90s was "eco", an ecological awareness spread even in textiles, which gave rise to the bringing of production plants up to standard from the point of view of environmental impact, and to product or process certifications (Oeko-Tex, Ecolabel). The recycling of materials was also developed, so that, for example, polyester fiber was given a new life from PET bottles and excellent caprolactam began to be obtained from disused polyamide carpets. The search for lightness in clothing will lead to an unimaginable expansion of microfibres destined to become the standard product of the future. With microfibre technology it will be possible to have hollow fibers with a diameter of a few microns. With these new products, padded fabrics with minimum thickness and feather weight will be created, warm like a duvet but not bulky. The creation of fibers was already being hypothesized, including the incorporation of ceramic compounds which, upon contact with light, can produce a beneficial sensation of heat to obtain fabrics that store the heat of the sun's rays and are able to conserve it. Interventions on the chemical composition of the polymer have increased fivefold, leading to new specialties, some already on the market, others in an experimental phase: from the fiber that changes color according to light and temperature, to the fiber that perfumes the fabric according to the desired essence, to the defined fibers 'functional' that respond to specific needs for well-defined fields of application. This rapidly expanding family includes fibers that conduct electricity, indispensable in fabrics for sterile room and clean room clothing, bactericidal fibers which will increasingly find application in the health and hygiene field, and flame retardant fibres, whose use is limited today. to a few sectors but which with the growth of a social conscience oriented towards prevention and safety, will become a much more widespread reality, for example in textiles and home furnishings and children's clothing. To give an example, bacterial fibers capable of killing all bacteria, even those that cause bad odor, or electrostatic fibers which will replace current treatments, which are expensive and ineffective, and will guarantee a real reduction in annoying discharges, are bi-component. electrical. Until now, 'hi-performance' fibers - such as carbon fibers or aramid fibers such as Kevlar - have always been linked to images of great performance or very high technology.
The word that re-presented the beginning of the new millennium was "anti", the fibers have become anti-bacterial, anti-static, anti-magnetic, anti-stress, anti-UV, anti-dirt, anti-bullet, always more flame-retardant, and the list seems to grow with recent discoveries, or with fibers already known, but relaunched in a marketing key suited to new times. The fiber industry is thus inspired by the concept of "wellness", a well-being that is no longer just physical but also spiritual, a serenity

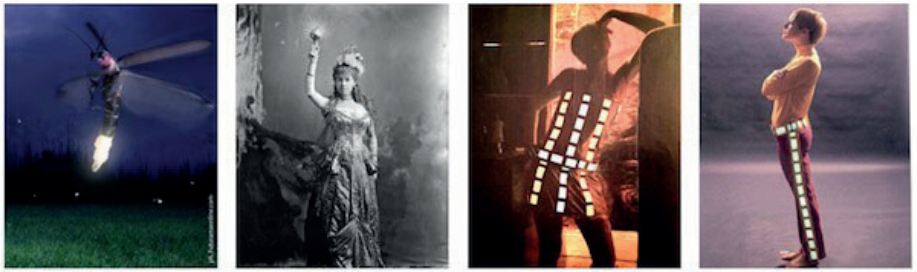

Fig.2 / Photo by fergregory/iStock/Getty Images Plus

and harmony of body and mind in which clothing, living spaces and means of transport, thanks the functionality and performance of the fibers that compose or decorate them also play a decisive role. In the new millennium, fibers will be able to capitalize on all the values they have acquired during their evolution. They have therefore confirmed that they are "intelligent" raw materials, too in the opinion of consumers, because they are present in daily life in a thousand forms already acquired and appreciated or introduced by new technologies.

Light

The concept of the body that emits light is described as a sacred body, giving divine forms to the body that appears to us as magical, starting from ancient times when the relationship with artificial light was more limited. This insight into light-reflecting or light-transmitting materials has a large number of approaches in different periods of human history. In ancient times, people used different items found in nature to illuminate their bundles. In some tribes, in different ceremonies and rituals, for example in Haiti, some vests are used which are influenced to call the holy spirits. In Central America, in the Middle East and in Asian culture, people are convinced that by transmitting light you can ward off evil spirits. Light can also be seen as a synonym of power, it is almost equated with the power of the sun as a great and unknown but necessary power for our lives.

There are also many microorganisms that transmit light to our planet, starting from squids to fireflies. This is a way of inspiration where artists and designers try to reflect and collaborate with chemists and biologists to realize their ideas and to create new possibilities for interactive textures with the human body. Biologists are using some bacteria that transmit light, they release the light enzyme that is responsible for the production of bioluminescence, to present it as a luminous thread. Trying to find opportunities to feed these bacteria that emit light throughout their life cycle. These threads can be woven or interwoven in the creation of the fabric. It can be designed as a textile layer that is placed between two fabrics that must resist steam to create the first Glow-in-the-dark fabric.

The interaction between light, electricity and fashion is not a phenomenon of the 20th century. From the end of the 1870s-1880s in France and England, some lighting accessories which, connected to a battery, create a stage light, become fashionable objects. The journal La nattura of Scientific American documents several drawings of Monsieur Trouvein Parigi, labeled as electric

[2a] *https://www.indianaconnection.org/harnessing-the-power-of-the-lightning-bug/*

[2b] *Mrs. Cornelius Vanderbilt aka Alice Claypoole Gwynne as 'Electric Light'. Gown created by Charles Frederick Worth. Vanderbilt Ball, March 26, 1883.*

[2c,d] *https://chantillylacevintage.wordpress.com/2014/09/15/diana-dew-and-wearable-pop-art/comment-page-1/.*

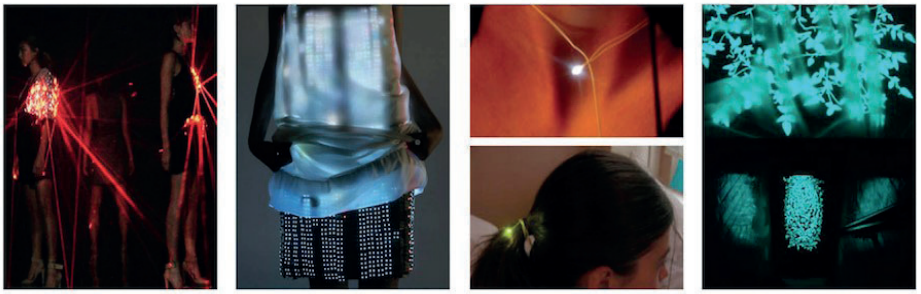

Fig.3a, b / Hussein Chalayan – Airborne – Video Dresses, 5050. Moi 2003.

jewels, which could be used by dancers and stage performers. They were charged by 2-4 volt batteries which were hidden under clothing. Some glass stones, which were placed on the lamps, shone on the power of the light as if they were precious stones.

Also, in the 60s, different designers tried to place light as part of their creativity, making the clothes more contemporary. In 1967, the designer Diana Dew created a garment with pants that transmitted light pulses from the pants, she also created a rechargeable battery for them. Time magazine of that time quoted him in an article about flexible plastic lamps sewn into clothing and pants. People who had this clothing could adjust the pulse rate from 1 to 12 pulses per minute, while the battery lasted up to 5 hours.

Also, the works of the designer Hussain Chalain have created wonderful works through the images of technology and fashion. During the 90s, he studied and applied the importance of artificial light in fashion clothing. In the 1995 collection through lighting he created his collection with religious themes by placing light inside the garment.

In 2003, more than 100 years after Trouve created his artificial light bulb, the Washington Post pointed out that the new sophisticated generation would be illuminated with MOI electric bulbs. For only 25 dollars you could have a piece of light that looks like a diamond. Created by (Seymour, 2008)attached to a thin thread that connects to a small battery. She sells the product as an accessory, which can be used as a pendant like a bracelet or a hair clip, it is the consumer who decides the way to use this simple but attractive piece of jewelry through the light it transmits through several colors.

While the light slipper is a curtain which, through gradual illumination, creates the sensation of dawn light and develops the process of gradual awakening. Humans are biologically influenced by light, so morning light conditions us and wakes up, in the case of Light slipper, artificial light stimulates the same effect on humans by programming a constant biological clock. The same weaving of threads that create the process of gradual illumination can be designed on quilts or different sleeping clothes. The development of this field requires the cooperation of lighting elements and a new way of charging for new recharging alternatives. Another development is related to chemistry, which with its development can chemically create mixtures of substances that chemically work together to transmit light under certain conditions. Japanese designer Kunihikomorinaga, one of the finalists of the LVMH prize, for many years, in addition to designing his collection, he also designs and creates the fabric itself, creating more and more innovative material in the world of textile design. A texture that he has created related to the theme of light is a fabric which during the day seemed simple and white and under the influence of ultraviolet rays it was transformed into a fabric with a colorful texture. He designs under the brand name ANREALAGE he created.

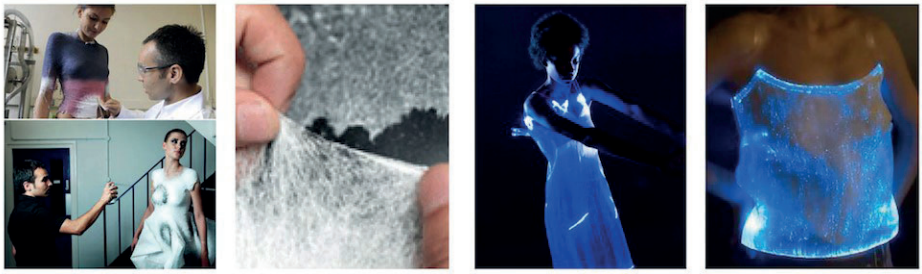

Fig.4 / spray dress Manuel Torres.Luminex textile dress

Light is a powerful modeler of space, something that adds to fantasy and the search for ever newer approaches to this material with the created fabric. Since four years, the company has been part of the St Gallen-based Forster Rohner Group, which has created a specialized work team for the design of textile materials. This year they were evaluated with the award "Tean awarded at Premiere Vision 2019". This award was achieved only after four years of working in the group from the moment the company was sold to the Foster Rohner Group. Every year, 1200 different design projects are developed from their offices.
Artists or other textile designers who have taken this initiative to create hi-tech textiles with their personal initiative can be found at the various world textile fairs. Some names of fairs of this type are Premier Vision in Paris, New York and Turkey. And Pitti filati in Firenze Italy, and MIUNICA in Milan and Singapore. Companies display the textiles created during the year while designers design and get inspired to create their collections. Some interesting names of designers who also create textures through innovative technology are:

"Who knows how we will be dressed? Perhaps with a material that we will use to spray the body, perhaps the women will be dressed in colored gases adhering to their bodies, or in halos of light, changing color with the movements of the sun or with their emotions"

...Paco Rabanne 1969 .

This is a message that Paco Rabanne quoted in 1969, in a reflection on new materials and materials technology. Paco Rabanne is one of the first designers who experimented with different materials to create his clothes. He became a master of metal turning design. The reason why he chose metal in many of his works is the reflection that this material brings brilliance, which shows another social style, which was not there before. His clothes create another woman who wears this material that is strong in composition but at the same time transparent in texture.
Many designers have been inspired by his courage to experiment with the material, thus opening the way to an endless exploration with every type of material that could be processed.
Analyzing what you think of Paco Rabane, I didn't even reflect on the truth of some fantasies, which have now turned into reality. Yes, for example, we will dress in a material that sprays our body. Spanish designer Manel Torres has turned this material into reality. By creating a polymeric mixture, which turns into a fabric for the body. Together with Professor Paul Luckham from I Lodres College, they have turned into reality this fantasy of the 60s that Paco Rabane expresses in his imagination.
Companies like Luminex are among the first to experiment with optical fibers.

Fig.5 / ANREALAGE A LIGHT UN LIGHT collection KUNIHIKO MORINAGA

The general characteristics of the fibers

Textile fiber is the set of fibrous products which, due to their structure, length, resistance and elasticity, have the property of joining, through spinning, into thin, tough and flexible threads which are used in the textile industry for manufacturing of yarns, which, in turn, through weaving, are transformed into fabrics.

Fibers are divided into two large categories: Natural and Chemical.

Natural: Natural textile fibers are those materials present in nature in the form of more or less long filaments, suitable for being transformed into yarn.

Natural fibers are also divided into Animal, Vegetable and Mineral

Animals: They are fibers made up of protein substances, and are wool, obtained from woolly animals such as sheep, camels, rabbits etc, and silk from the silkworm cocoon.

Plants: They are mainly composed of cellulose and are obtained from different parts of plants: from the stem, as in the case of flax, hemp and broom, from the seeds, as for cotton, and also from the leaves, as in the case of sisal.

Minerals: They are obtained from minerals such as asbestos.

Technofibres: Technofibres are also called (man-made fibres) as they are produced by man and constitute an important achievement of modern chemistry. And they are divided into two categories: artificial fibers and synthetic ones.

Artificial: They are obtained from natural products such as cellulose and protein. At its beginning it was called artificial silk because despite its different original nature, the fiber had the same shine as silk. It is developed through chemical processes.

Synthetic: They are obtained from chemical products derived from petroleum and reduced to filaments. They are distinguished based on the primary material which can be organic or inorganic and on the different manufacturing processes.

Fibers have different properties: morphological, chemical, physical, mechanical and physiological.

Morphological characteristics, is the study of the internal and external structural form of organic elements. Geometry, shine, the hand

Chemical characteristics, is the study of the structure, composition, properties and transformability of natural and artificial organic and inorganic substances. Stability and resistance.

Physical mechanics, and the study of heat behavior, hygroscopicity.

Physiological is the study of resistance to bacteria and mold, allergies, the sense of heat and cold it transmits.

In this part I have tried to divide the fibers into the two large groups they belong to, the natural

ones and the artificial ones. As I also explained above, both natural and artificial fibers can be attributed the same characteristic properties but their origin is different. The possibility of creating fibers through the laboratory leads to a greater possibility of transformation and adaptability to create clothes in all contemporary shapes, obtaining the desired shape and softness or hardness.

Fibre tesili

Naturali	Tecnofibre
Vegetali	Artificial
Animali	Synthetic
Mineral	Inorganic

-Polymers

In artificial fibres, the polymer already exists in nature: it just needs to be extracted and processed. In synthetic fibres, however, the polymer is produced by man, generally by aggregating molecules of synthetic elementary monomers. This aggregation is called 'polymerization' and can occur according to two principles: polycondensation and polyaddition.

Polycondensation is a reaction sequence between monomers that are the same or different from each other, all equipped with at least two functional groups, capable of interacting by forming bonds that interconnect the single molecules in more or less long chains. Polycondensation polymers are polyester and nylon 66.

Polyadizine is a series of reactions between monomers that are the same or different from each other (comonomers) generally characterized by double bonds, i.e. by an internal energy charge capable of transforming under the action of particular activating substances called 'catalysts'. ', in bonds between individual and individual, to form more or less long polymer chains. Polyaddition polymers are for example acrylic and polypropylene polymers.

Long before plastic and synthetic polymers existed, many years ago until life began on earth, nature used natural polymers to make life possible. Artificial polymers are the ones that have changed our lives nowadays.

Artificial fibres

Fibers that derive from subsequently modified natural polymers are called artificial; they can have a base of cellulosic or protein origin.

The first artificial fibre, industrially made and patented as 'artificial silk', used cotton linters that could not be used in spinning as raw material, taking them in cardboard boxes, bleaching them and treating them with a mixture of nitric acid and sulfuric acid. Hence the name 'Rayon Nitro', from the French 'rayed', to allude to its shine. Artificial fibers are: cellulosic and protein (the latter no longer in use today). Artificial protein fibers are fibers that are obtained starting from natural proteins of vegetal or animal origin, produced in continuous thread or in staple form.

Cellulosic fibers are viscose, cupro and acetate.

Viscose in continuous thread and staple. It is produced by wet spinning a cellulose derivative made soluble in water and caustic soda, drawn through a die, immersed in a coagulant bath, stretched to make it a continuous thread, then washed, bleached and collected. And a white, smooth, shiny, medium tenacity fiber does not melt and tends to swell in contact with water or humidity. It has a sweet, silky hand and a soft touch. In continuous thread it is used in silk fabrics and for the production of lining. As a staple it is generally used mixed with cotton or polyester for cotton-type fabrics.

Cupro

In continuous thread. It is produced from cotton linter. It is a fiber that has a silky shine, softness to the touch and smoothness; it is slightly more hygroscopic than cotton, does not become charged with static electricity, has good resistance to chemical agents, solvents and atmospheric

and biological agents. It can be dyed in very bright colors and is used in silk fabrics, high quality linings, linens, velvets, damasks, brocades, lampas and in the knitwear sector for the production of underwear items.

Acetate

It is a fiber composed of a cellulose ester from coniferous trees, dissolved with a solvent, extruded, spun into a continuous thread and dried. The acetate fiber has a shiny and brilliant appearance, and is light, soft, silky, antistatic, has a medium elastic recovery, has high tangibility and can be mass, yarn or piece dyed. It is also used mixed with all other fibres, natural and otherwise.

Synthetic fibres

Launched on the American market in 1935 and widespread in Europe five years later, synthetic fibers differ from artificial fibers because they are produced from compounds derived from petroleum which, when appropriately treated and transformed into polymers, become filamentous substances of a very complex nature, direct for different uses. In fact, their main characteristic is the high level of design aimed at the intended use. They are resistant, crease-proof, resistant to mold and moths, thermoplastic. They are produced in thread or staple. Upon qualitative analysis they appear perfectly regular, homogeneous, with a regular section. Synthetic fibers are polyamide or nylon, acrylic, polyester, polypropylene, polyvinyl, polyethylene, polyfluoroethylene, polyurethane.

Polyamide or Nylon

Patented in 1935 with the name 'Nylon' and widespread since 1940, they are fibers obtained from derivatives first of carbon and then of petroleum. They can be in continuous thread or in staple. They are tough and elastic, not very hygroscopic, resistant to ageing, crease-proof, thermoplastic, dyeable, unshrinkable, resistant to mould, microorganisms and moths, easy to maintain (washing, drying and non-iron). They have a smooth, shiny and light 'hand'. They are mainly used as a thread for silky (elastic) stockings, as a weave for waterproof fabrics, for icing fabrics, tulle, linings, velveteen, warp knitwear.

Acrylics (Acrylic)

They are obtained in staple and microfibre form from acrylonite derivatives: they are properly called "acrylic" if they contain acrylonitrile in a percentage greater than 85%, they are called "modacrylic" if they contain it in a lower percentage, generally between 50% and 60%. They are light, soft, voluminous fibres, unshrinkable when washed, resistant to light, atmospheric agents, mould, microorganisms and moths. They give the fabric a soft and warm "hand" to the touch. They are produced in cotton and wool types; special treatments enrich them with further properties, such as the addition of halogenated components which make the fiber fire-resistant, or the treatment used for the use of the fibers in external knitwear, pure or mixed with wool or other natural fibres. or synthetic. Mixed with cotton they are widely used in sweatshirts

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resistance to shrinkage and felting. In all blends they improve crease resistance, non-deformability and increase the lightness of the "hand".

Polyester (Polyester)

Derived from a compound that is formed, by the elimination of water, between an acid and a glycol, they are fibers produced in continuous thread and staples. They are tough, elastic, resistant to air, heat, atmospheric agents, light, bleaches, with high thermal stability. Thermoplastic, crease-proof, resistant to mold and moths, they give the fabrics non-shrink and non-deformable characteristics, are easily washed, dry quickly and do not iron. They are lustrous fibers that allow brilliant dyeing.

Polypropylene

They are paraffin fibers obtained from the polymerization of propylene coming from petroleum. They are elastic, wear-resistant, stain-resistant, water-repellent, insulating and resistant to atmospheric agents. They can only be dyed through. They have a light, pleasant and quite bright "hand".

Polyvinyl

They are fibers obtained from vinyl chloride. They are very resistant to combustion, thermosensitive, with good insulating power, difficult to dye and are easily charged with static electricity.

Polyethylenes

They are fibers obtained from the polymerization of ethylene. They are not hygroscopic and cannot be attacked by solvents and acids. They fear heat, a particular type is used for protective fabrics.

Polyfluoroethylenes

They are fibers insoluble in solvents and inert towards chemical reagents; they resist low temperatures, do not absorb water, resist heat, humidity and radiation and are used for highly sophisticated technical products.

Polyurethene (Elasten)

They are fibers produced in the form of elastomeric threads, that is, extensible, elastic, resistant to traction and bending. When the pulling force ceases, they return to their initial dimensions. They are often used mixed with other chemical or natural fibers to make them elastic and non-deformable. Covered with various types of threads wound in a spiral around the core of the thread, they are used in hosiery, knitwear and stretch fabrics.

Commercial terminology of some fibres.

Very light fabrics.

Btista, Cady, Calicot, Chiffon, Calico, Gauze, Muslin, Organza, Eggskin, Peachskin, Deerskin, Gingham, Poplin, Voile, Tulle.

Mottled effect fabrics

Iridescent, Chinè, Embossed, Moiré or Marbled.

Diagonal ribbed fabrics

Cannelé or cinnamon, Canneté, Denim, Drill, Faille, Gabardine, Levantina, Grisaglia, Piqué, Reps.

Light relief fabrics

Ottoman, Oxford.

Fabrics with an irregular feel

Bouclè, Crepe or Crespo, Frisè, Santung, Stretch.

Compact, robust and heavy fabrics.

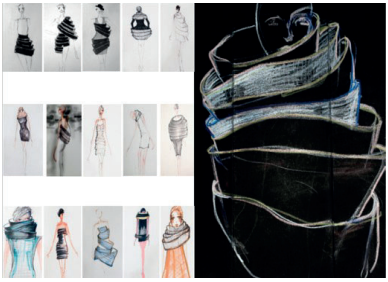
Cloth, Covercloth, Cretonne, Felt, Loden, Panama, Tweed

Furry and soft fabrics

Duvetine, Plush, Flannel, Fustian, Lenci, Cloth, Plaid, Patchwork, Plush, Shetland.

Other fabrics

Chenille, Chintzz, Ciré, Gobelin, Madras, Pied-de-poule, Plissé, Prince of Wales or Wales, Quilt, Sangallo, Tartan, Tricot.



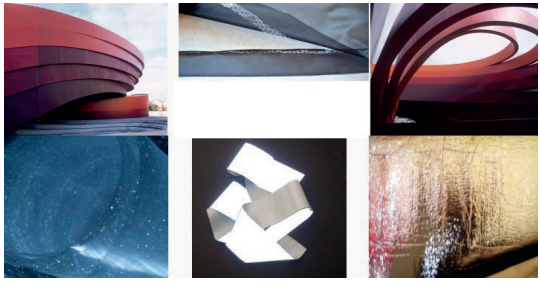


Fig.6 / Sketch by the author
Fig.7 / Materials used for the project

Optic fiber

Fiber optics allow light to go around corners, describe circles and curves, and bend. The term 'optical fibre' was used around 1956 to mean optical glass drawn into long, thin filaments, capable of transmitting electrical impulses and light. In the 1960s the new technology continued to be developed and implemented, physicists, chemists and engineers initially tried to conceive and produce a type of glass transparent enough to transport light over a distance of one kilometre. In 1970 Corning discovered that two types of glass were needed, allowing research to take a major step forward. Optical fibers are composed of two glass cylinders, core and cladding, with different refractive indices. The purity of the core allows the light to pass through the entire length of the cable without encountering obstacles, while the lower refractive index of the cladding prevents it from escaping. Very thin and lighter than copper, glass fibers today carry astonishing quantities of information, a further example of the use of glass in areas of technology that seem very far from its most obvious qualities. Technological advances in one field inevitably push related industries to evolve accordingly, super-thin glass for flat screens being one example. The increasing miniaturization of portable electronics requires ultra-thin borosilicate glass for greater transparency and better scratch resistance than the alternative, polymers. A characteristic of this type of glass is flexibility, which allows it to form into curved screens. It is widely used in touchscreen displays.

Spirals – and interactions between geometry and light

This inspiration came from a reflection between architecture and design, in which I found many points in common both in the creative concept and in the design.
Architecture is created to define a space. This also happens with clothing, it is created to define our body as our belonging. With the dress we create a story because through the dress we can define the period in which that clothing and above all those fabrics were used. This aspect is also part of the project in architecture defining a time. In buildings all new materials and new technologies are used to reduce the time of the construction process and to improve the appearance and strength of resistance, and the same thing is compared in clothing in which new technologies help to ensure that the garments are more comfortable, durable, pleasant and to obtain formal situations and in some cases very innovative aspects.
Furthermore, I searched for formal solutions with different effects through technical materials that interact with light, which develop with the spiral shape of the dress

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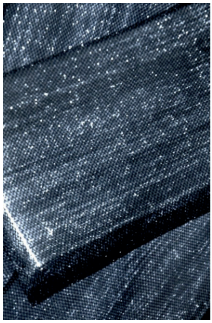

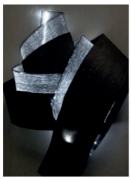

Fig.8 / Materials used for the project
Fig.9 / Dress created with Luminex fiber optic and neoprene

Fig.10 / Dress created with Luminex fiber optic

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