Does this computer come in a Size 6?

By MARK GUARINO
CONTRIBUTOR

CHICAGO

INTERACTIVE FASHION TREND WEARS DEVICES ON ITS SLEEVES.

The solar panel in your winter coat warms your back. An LED light on your skirt warns passers-by to give you room on the sidewalk. The display on your eyeglasses flashes the temperature after you slip them on.

Already hanging in designers' studios, these curious clothes may soon make their way into America's wardrobe. Interactive fashion, the intersection of electronics and apparel, is a relatively new school of design. Engineers and couturiers, two parties that previously knew little about each other, are locked in intense collaborations today to reshape the role clothing plays in daily life.

As modern culture embraces mobile phones in our pockets, Bluetooth headsets in our ears, and Nike odometers in our shoes, the logical next step is wearing devices on our sleeves, says Tiffany Holmes, chair of the art and technology department at the School of the Art Institute of Chicago, one of the few schools in the United States that offers classes on wearable technology.

"Fashion is about the latest trends and styles, so it really makes a lot of sense this is happening now," she says.

As Ms. Holmes sees it, with young consumers wearing white headphones as often as earrings, they will soon require apparel to streamline their digital needs.

"One of the things about Western culture is, if we have access to information that is deliverable to our bodies, we will want that," says Holmes. "Changes in clothing are not that far off."

Interactive fashion has been around for as long as kids' shoes came with blinking lights in their soles and sportswear featured hidden pockets for music players.

Newer examples include a T-shirt from thinkgeek.com that detects nearby wireless Internet signals. The logo on the front of the shirt changes as Wi-Fi connection strength waxes and wanes.

But all of these were destined to be marketplace novelties until technology shrunk. While the Wi-Fi T-shirt wants you to tuck a AAA battery box under your belt, new computer chips with the dimensions of a fingernail are now tailor-made for textiles.

For older consumers who grew up with rabbit ears atop their giant Zenith TVs, the idea of interacting with

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A year to celebrate the achievements of Galileo and Darwin

[onscience]
BY ROBERT C. COWEN

This is a year of celebrations for the world's scientists. Biologists remember Charles Darwin, whose 200th birthday falls within this month. November marks the 150th anniversary of his seminal book "On the Origin of Species." Astronomers honor Galileo, who made the first telescopic observations of celestial objects 400 years ago this autumn.

But while scientists whoop it up for their historic heroes, they want fellow citizens of the world to join the festivities. The aim, they say, is to share the wonder and insights of their science with all humanity.

Astronomers kicked off the International Year of Astronomy last month with a symposium in Paris. The "year" includes events organized around the world, such as well-illustrated presentations and lots of eyeball-to-telescope public viewing and Internet-accessible cosmic images. The logo branding these events proclaims "The Universe: Yours to Discover." If you want to join the fun and download that logo explore the website at astronomy2009.org.

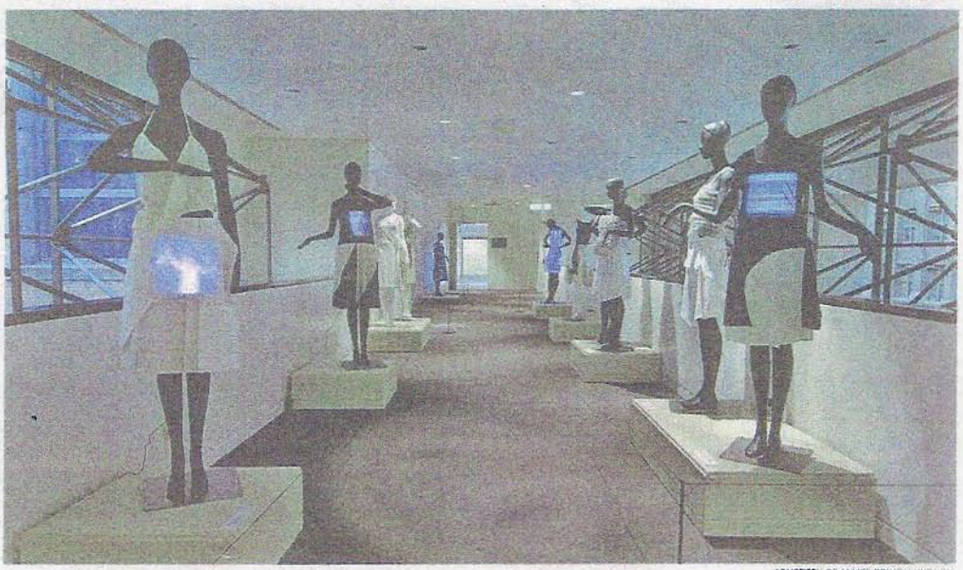
There will likewise be many ways to celebrate Darwin's bicentennial. The high point will be a five-day festival of science in July at the University of Cambridge in England. When a similar three-day science festival was held there at Darwin's centenary in 1909, you had to be there to enjoy it. But thanks to the Internet, much of this year's festival can be shared globally. Check out the website at www.darwin2009.cam.ac.uk.

All this outreach is aimed at helping to increase public understanding of science. The American Association for the Advancement of Science, which supports the Cambridge festival, emphasized that point in its journal Science saying: "In today's society where science is broadly integrated in enhancing human welfare such a broad public understanding is required of not just new discoveries, but of their deep and enduring roots."

Darwin's theory of evolution envisions useful new traits arising naturally within a species giving the individuals so favored an edge for survival. This theory of natural selection or survival of the fittest remains a guiding principle in biology. But Darwin thought the changes arose only within a given species. He envisioned life's evolution as a tree starting from a single common ancestor and branching again and again as changes arising within existing species gave rise to more and more new species.

Modern DNA studies indicate that species can acquire new traits by sharing genes with each other. This makes life's evolution look more like a web of interacting strands than an ever branching tree. The question of what metaphor to use for life's evolution is at the cutting edge of biological research today. Darwin's key idea of natural selection remains useful but has itself evolved.

Scientists are keen to share their understanding of the thought processes by which yesterday's science leads to a better understanding of nature today. In an editorial in the journal Science, cosmologist Martin Rees at Britain's Cambridge University put it this way: "Science is the one truly global culture, and it is surely a cultural deprivation to be unaware of the chain of events ... whereby, on at least one planet, Darwinian selection led to the emergence of creatures able to ponder their origins."



COURTESY OF JAMES PRINZ/ANKE LOH

SOFT WEAR: Designer Anke Loh's 'Dressing Light' collection weaves optical fibers and LED lights into dresses.

Fashion: Part clothing, part computer

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your favorite pair of pants may seem hard to swallow. But to consumers who regularly stream YouTube clips on their iPhones, the evolution of digital-ready clothing is not so far-fetched.

"You're going to see more clothes marketed to the younger generation because the technology is so much a part of their life that fashion needs to reflect that," says Beth Wilson, a writer for Women's Wear Daily.

While the applications remain in the infancy stage, interest in the fashion community is building as designers see this field as a sort of last chance to revolutionize their industry.

Replacing threads with cords, however, requires some serious rethinking. Electronicsmakers such as Philips, Bluetooth, Motorola, and Apple are funding research projects to discover, for instance, just how much optical fiber can be sewn into a sweater before it stops feeling like a sweater. Reevaluating comfort against function is a chief concern of this trend.

COURTESY OF YOUNGHUI KIM

For fashion, the floodgate moment will come once someone figures out how to change a computer's unyielding aversion to water so that it can be washed and worn without difficulty or discomfort.

"The challenges really are in certain electronic components. Transistors have not become soft yet," says Margarita Benitez, who will teach the inaugural course on interactive weaving at Chicago's Art Institute this fall.

Ms. Benitez is like many designers who have shifted from making one-of-a-kind art objects that question society – a necklace she designed called the "Detect Protect" warns the wearer of electro-magnetic fields – to becoming laboratory tinkers working to see their ideas mass-produced.

In 2006, she worked with The Jacquard Center, a textile research lab in Hendersonville, N.C., to develop a loom that can generate fabric based on video imagery from a computer feed.

"The textiles that work best with electronics are weaving and surface embroidery," because the cables can be incorporated naturally into the piece, rather than bolted on later, she says. "In just the same way you can quilt, you can implement components within textiles."

Having designers rethink sewing as coding takes extreme patience and a willingness to collaborate, says Younghui Kim, a self-described "interactive wearable media artist" in New York who teaches at Hongik University in Korea.

Ms. Kim is a rarity in the fashion world: She became interested in design only after working for years in telecommunications. Staring at computer screens all day created "a really strong need to design something [she] could feel or touch."

"So I started picking up sewing machines and fabrics, and I designed like a software engineer," she says. At the time, around 2002, it was frustrating for her to see designers make interactive clothing that was functional, rather than beautiful or comfortable.

She created "HearWear," a series of couture skirts laden with sensors that trigger illuminating wires depending on how loud the area is. The skirt becomes "a city ear painting," she says.

Of course, as Apple showed with personal computers, a stylish product will primarily appeal to luxury-minded consumers before hitting the racks at Target.

Chicago designer Anke Loh worked with the electronics company Philips in 2006 to create "Lumalive textiles" that animate simple dresses with moving images or text. She is now working with engineers between London and Chicago to find ways the concept can have street appeal.

"I still think to put lighting in ready-to-wear garments has still not yet been explored enough," says Ms. Loh. "Incorporating light or sound into clothing is to find the possibilities to make it attractive. So it looks more natural [and not] like a stop light."

Correction

A Jan. 22 article on lithium technology, "Worldwide race to make better batteries" on page 13, misstated which regions of the world hold large deposits of lithium. China and South America sit on two of the biggest caches.