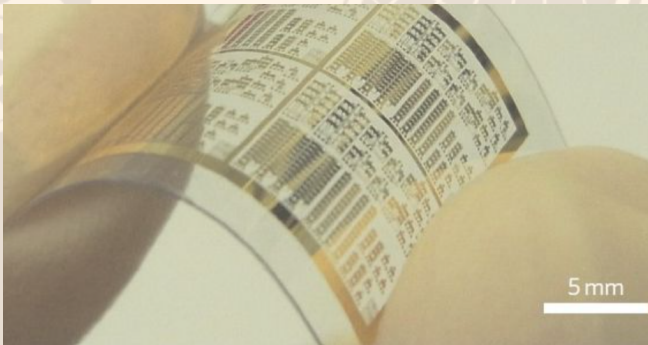


# PRAXZINE

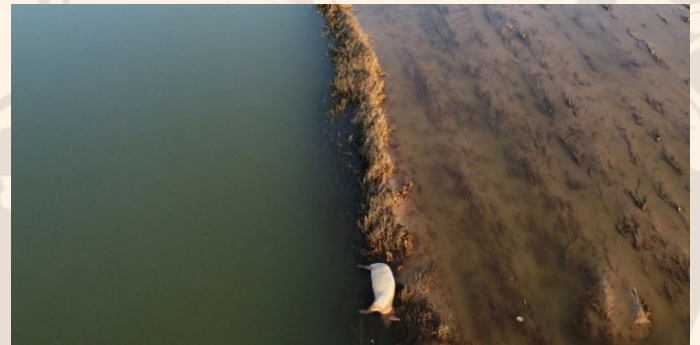
*a fortnightly newsletter by Praxeis, Alliance University*



## FEATURED PIECES



**Nanotube Electronics**



**World's Food Supplies Get Slammed by Drought, Floods and Frost**



**Ola's massive push in the EV 2 wheeler sector**

# Nanotube Electronics

- Aman Garg

## Nanotube

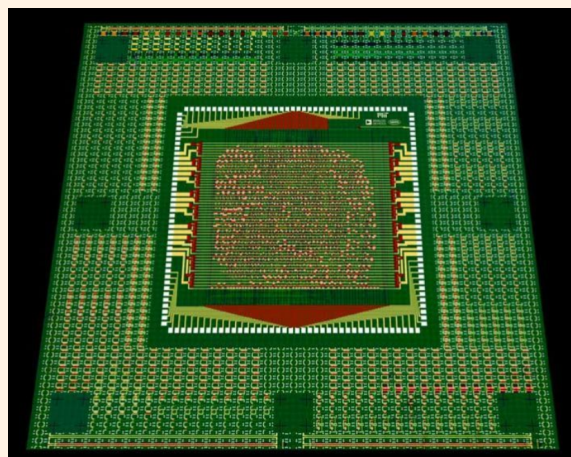
Microscopic wires of the future could be made from carbon nanotubes—rolled-up sheets of graphite only angstroms in diameter. Nanotubes could also be made into electronic devices like diodes and transistors, which are traditionally made from junctions of two or more semiconductors having different electrical properties. Nanotubes should indeed be useable for diodes and other electronic components, once the fabrication techniques improve.

Nanotubes knew as “dream materials” by the scientific community for building tiny circuits. They’re strong, nonreactive, tolerant of extreme temperatures, and pass current essentially without resistance. They’re also much smaller than any wires in today’s electronics. Surprisingly, nanotubes can have either metallic or semiconducting properties, depending on their geometry: Starting with the all-carbon honeycomb lattice of graphite, you can roll either type of material depending on the direction of the cylinder’s axis compared with the lattice.

## Uses

Electronic amplifiers, switches, and computer logic elements are all made from combinations of semiconductor junctions—interfaces between pairs of materials with differing concentrations of the current-carrying electrons and holes.

In semiconductors, a simple junction makes a diode, which carries current in only one direction. Researchers have already manipulated the carrier concentrations in nanotubes.



## Application

### Spintronics

Besides transistors, nanoelectronic devices play a role in data storage (memory). Here, spintronics – the study and exploitation in solid-state devices of electron spin and its associated magnetic moment, along with the electric charge.

## Optoelectronics

Electronic devices that source, detect and control light – i.e. optoelectronic devices – come in many shapes and forms. Highly energy-efficient (less heat generation and power consumption) optical communications are increasingly important because they have the potential to solve one of the biggest problems of our information age: energy consumption.

## Electronic textiles (e-textiles)

Electronic textiles (e-textiles) are wearable electronics that are no different from the normal clothes we wear. design and production of a new generation of garments with distributed sensors and electronic functions. Such e-textiles will have the revolutionary ability to sense, act, store, emit, and move – think biomedical monitoring functions or new man-machine interfaces – while ideally leveraging an existing low-cost textile manufacturing infrastructure

## Energy storage

Solar cells and supercapacitors are examples of areas where nanoelectronics is playing a major role in energy generation and storage.

## Molecular Electronics

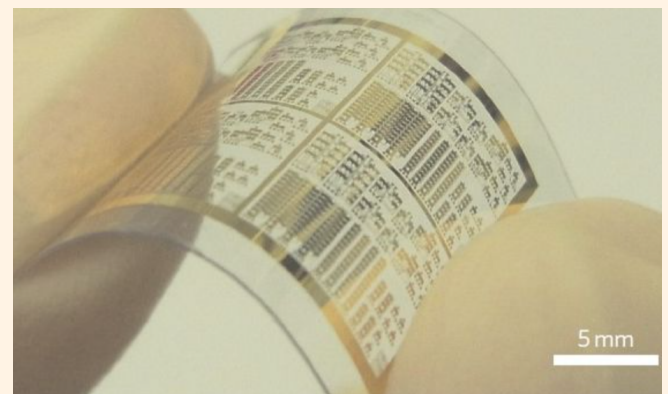
Distinct from nanoelectronics, where devices are scaled down to nanoscale

levels, molecular electronics deals with electronic processes that occur in molecular structures such as those found in nature, from photosynthesis to signal transduction.

## Computing

Carbon nanotubes, though, are almost as thin as an atom. And they ferry electricity well.

As a result, they make better semiconductors than silicon. In principle, carbon nanotube processors could run three times faster than silicon ones



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# World's Food Supplies Get Slammed by Drought, Floods, and Frost

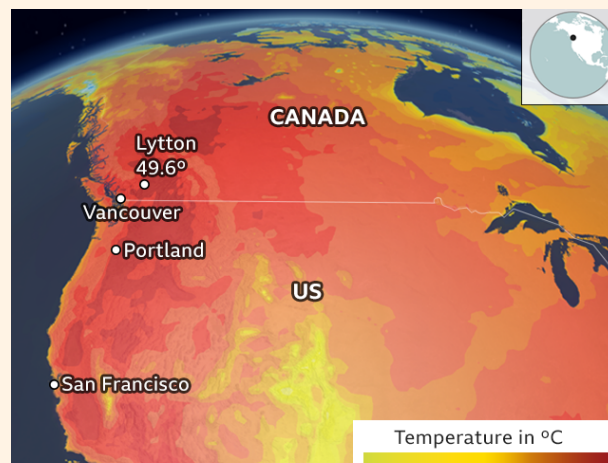
- *Keshav Yadav*

Catastrophic crop failures caused by extreme weather in just one country could disrupt global food supplies and drive price spikes in an interconnected world, exposing how climate change threatens global stability, according to many researchers around the globe.

Extreme weather is slamming crops across the globe, bringing with it the threat of further food inflation at a time costs are already hovering near the highest in a decade and hunger is on the rise.

The series of misfortunes underscores what scientists have been warning about for years: Climate change and its associated weather volatility will make it increasingly harder to produce enough food for the world, with the poorest nations typically feeling the hardest blow. In some cases, social and political unrest follows.

What's unique right now is that extreme weather seems to be pounding almost every region of the globe.



## Scorching North America

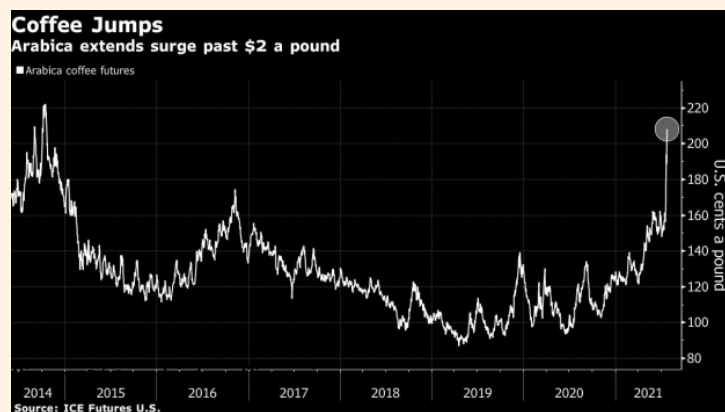
Dry conditions in Canada coupled with record-breaking heat triggered hundreds of wildfires, with blazes spanning east across five provinces and nearly as far north as the Arctic Ocean areas. Fires have been so treacherous in westernmost British Columbia that thousands of rail cars carrying grain for export have been idled for weeks. The drought is also withering crops in Canada's breadbasket provinces and in the northern U.S., forcing farmers to take the rare step of baling up their low-yielding wheat and barley stems to sell as livestock feed.

The prices for wheat recently touched the highest in more than eight years. Even fresh shellfish in the Pacific Northwest have fallen victim to the extreme heat and its impact on marine life.

## Frost and Worst Droughts in Brazil

An unusual cold snap, with temperatures dropping to freezing levels in a matter of minutes, delivered a blow to the heart of Brazil's coffee belt, damaging trees and harming prospects for next year's crop. Preliminary estimates from exporters and agronomists point to a potential reduction of 1 to 2 million bags in next year's coffee crop.

Earlier year drought “disaster” that eroded prospects for Brazil’s next crop of beans preferred by major coffee chains may carry over to the following season. Coffee prices surged nearly 13% in response to the frosts to a 6-1/2-year high.



## Flooded China

Flooding in the central Chinese province of Henan in July this year, a hub for agricultural and food production appears contained for now but is being closely watched for any sign of more serious disruption.

A bigger worry is the potential spread of animal diseases, the growing risks of animal epidemics after the Henan disaster, predict diseases could spread from dead animals as well as via contaminated soil and water. Local authorities were urged to retrieve carcasses from lakes and rivers, disinfect breeding pens more frequently, and strictly prohibit the sale and processing of dead animals.

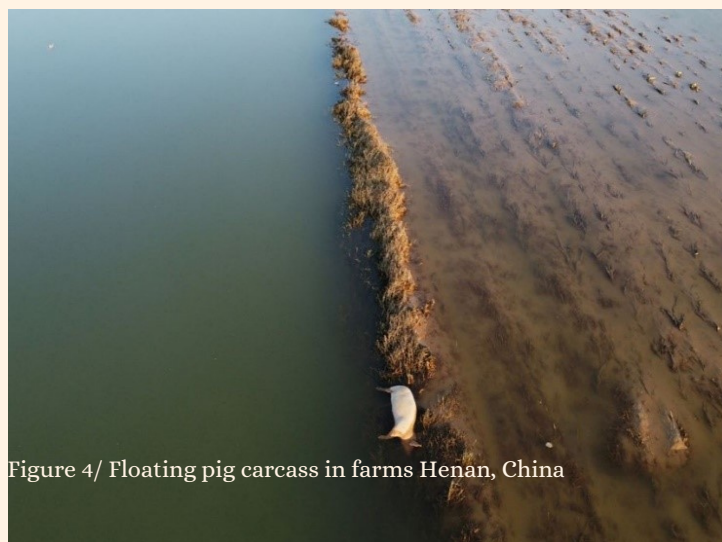


Figure 4/ Floating pig carcass in farms Henan, China

## Soggy Europe

The severity of crop losses driven by heatwaves and drought has tripled in the last fifty years in Europe, according to a study that highlights the vulnerability of food systems to climate change. Dramatic images of inundated towns in Germany and Belgium this month are adding to a wetter-than-usual summer across much of Europe.

Rain has taken its toll on grains, leading to harvest delays. That follows a spring of frosts that damaged crops from sugar beets to fruit trees and devastated some vineyards in France and elsewhere. The European wheat output is expected to rise this year, but harvest may end up switching from milling for bread products to feeding farm animals instead. That threatens shipments to North America, which relies on imports of high-quality grain.

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# Ola's massive push in the EV 2 wheeler sector

- Dr George Easaw

**Ola company is gaining a lot of attention these days. It is trying to electrify the world of urban mobility. The question is how, where, and when.**

First of all, Ola is building the world's largest scooter facility in Hosur Tamil Nadu on a 500-acre plot. Btw, Hosur also has TVS and Ashok Leyland factories in the Krishnagiri district in Tamil Nadu.

This Ola plant is to start production in the middle of 2021. At full capacity, the 20 million production capacity of this Ola plant would be about 15% of the global scooter production.

For Bhavishh Agarwal, a 35-year-old 2008 IIT Bombay Engg graduate who is the CEO, it is a great opportunity to ensure shared, sustainable, safe, accessible mobility to the urban masses. Is this guy set to change the face of urban mobility in India forever? First, he took us away from private ownership of vehicles to the shared vehicle,s and now he wants to take us back to private ownership with different technology.



*Why electric scooters and why this large number?*

2 wheelers have been the mode of transport of the common man throughout the world and India is no exception. With the increase in the cost of petrol, even this mode was getting a bit unreachable for the masses. Ola enters the Indian market at the right time.



Electric 2 wheelers will be a big hit with the Indian population which still has a major portion still not able to afford a 2 wheeler, forget a 4 wheeler. The high cost of vehicle and of the fuel, petrol is the biggest deterrent for most of the people these days. In India, the present number of scooters for a population of 1000 is just 160 comparing with 600 for Vietnam. That's a long way to go .

The good thing about the Ola plant in Hosur, Tamil Nadu is the size. It will at full production manufacture 20 million ie, 20,000,000 EV scooters annually, besides motorcycles and 4 wheelers too in due course. Manufacturing to scale of this magnitude is sure to bring down the unit manufacturing costs. Besides it can also spur an array of innovations in the manufacturing sector in India.

The manufacturing plant is about 43 acres in area under one roof, the largest in the world. The first phase of production at an investment of INR 2400 crores, of 2 million annually, though supposed to be out by June has been delayed a bit and it is hoped will be open in the very near future.

The plant has an employment potential of 10,000 people and is being financed majorly by venture capitalists SoftBank of Japan and Tiger Capital, the New York based venture capital fund.

As a management student, one is interested in understanding the risks associated with this investment.

Entirely funded by venture capitalists, who are looking at the future prospects of this mobility mode, the risk is equally shared by Ola and the venture capitalists, who have done their due diligence before committing INR 2400 crores to this project.

The support from the Tamil Nadu govt for this project, besides Tamil Nadu being the automobile hub of the country, can give a lot of push to successful, high-quality low-cost manufacturing possible from this state which is already blessed with enough technical manpower in this area.

What is the lesson for the other entrepreneurs of India at the massive risk Bhavish is undertaking? With great risk appetite, the Ola EV scooter case spearheaded by Bhavish is a lesson automobile manufacturers the world over is looking for with awe and admiration. How a young lad of 35 years is rewriting automobile dynamics in India ?

Will he be able to move with the same momentum when the global EV leader TESLA enters the Indian market maybe in a few year's time. Would Bhavish have set the ground for a tough fight between an established global EV player and a new player in the Indian domestic market? What does this Make in India for the world entail for the global EV market?