Microwave**Journal's**

STEM Works

IoT [In•ter•net of Things]

The linking together of ubiquitous intelligent objects on a global scale. The Internet was originally developed to enable large, institutional computer systems to communicate remotely. Through Moore's Law, computing power continues to increase exponentially with a corresponding reduction in size and cost. This is accompanied by an ever expanding capacity for data transmission and storage. Along with the development of sophisticated sensors, this has enabled inanimate objects around us to become more and more intelligent and able to interact both individually and collectively in complex ways, through the Internet, with human beings, other objects and the environment around them.

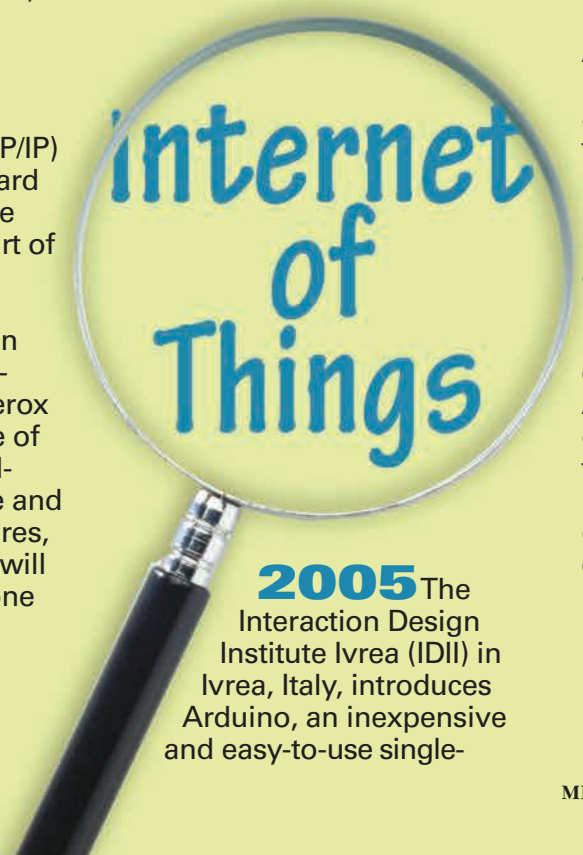
October 29, **1969**, the first message is sent over the ARPANET, predecessor of the Internet.

Early **1980s**, one of the first Internet-enabled appliances is a Coke machine at Carnegie Mellon University instrumented to communicate its status to programmers located several floors above, saving them a wasted trip should it be empty.

January **1983**, the Internet protocol suite (TCP/IP) is introduced as the standard networking protocol on the ARPANET, marking the start of the modern Internet.

September **1991**, an article in "*Scientific American*" by Mark Weiser of Xerox PARC, describes the future of computing where "specialized elements of hardware and software, connected by wires, radio waves and infrared, will be so ubiquitous that no one will notice their presence."

1999 Bill Joy (co-founder of Sun Microsystems) describes an Internet of sensors and device-to-device communication that embeds machine intelligence in everyday life. Kevin Ashton of Procter & Gamble first uses the term "Internet of Things" to link the Internet with RFID technology in P&G's supply chain concept.



2005 The Interaction Design Institute Ivrea (IDII) in Ivrea, Italy, introduces Arduino, an inexpensive and easy-to-use single-board microcontroller enabling experimenters to connect and control everyday objects through the Internet.

October **2011**, an example of home automation, Nest Labs introduces a cloud-connected thermostat that learns occupant behaviors and preferences, and adjusts temperature automatically.

April **2012**, Google begins testing Google Glass, a wearable technology in the form of an optical head-mounted device that displays information collected wirelessly through the Internet as directed by the user.

December **2013**, Qualcomm and others form the AllSeen Alliance to develop an open framework for enabling the IoT. The following year, Intel establishes a competing group called the Open Interconnect Consortium.