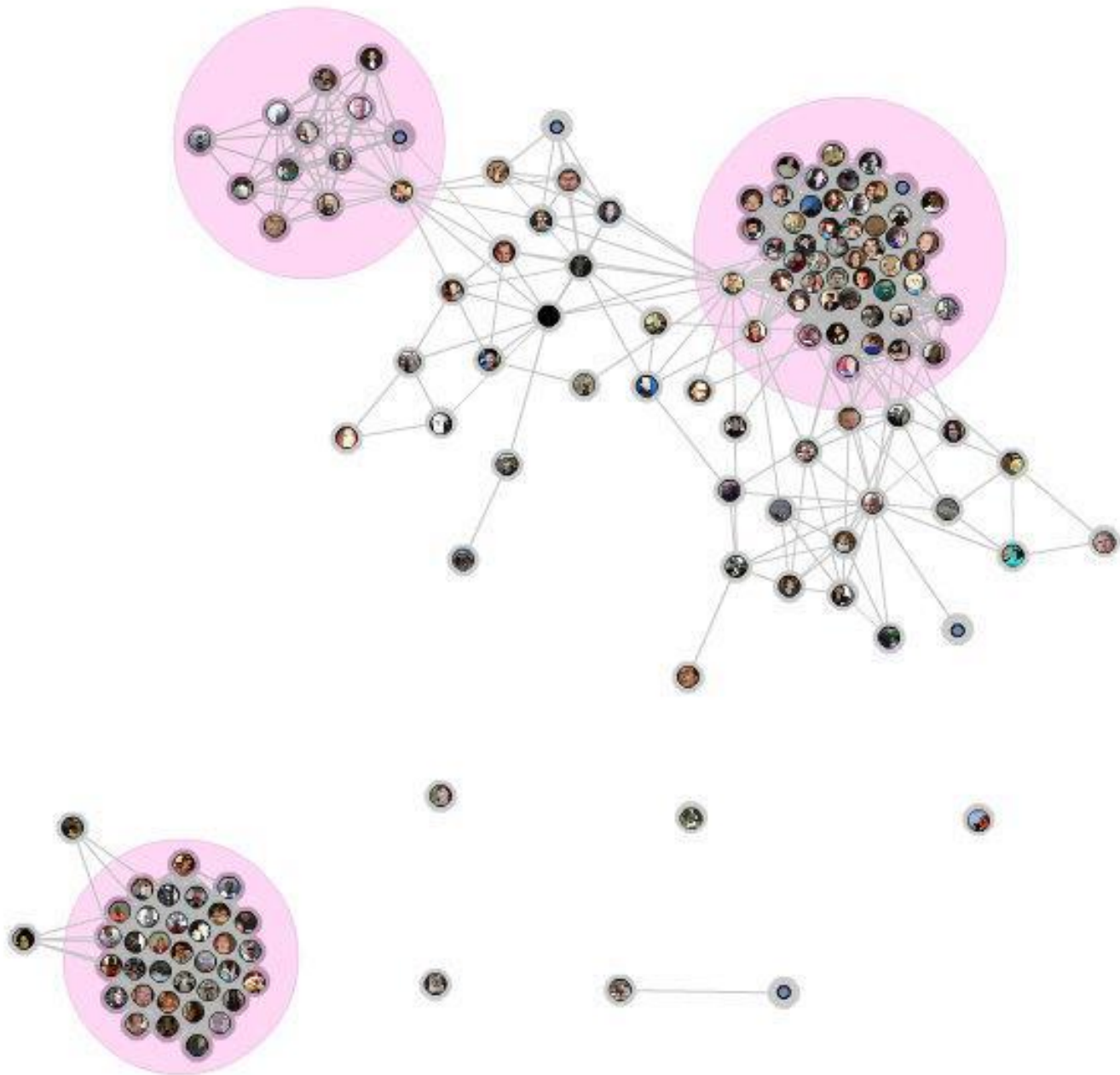
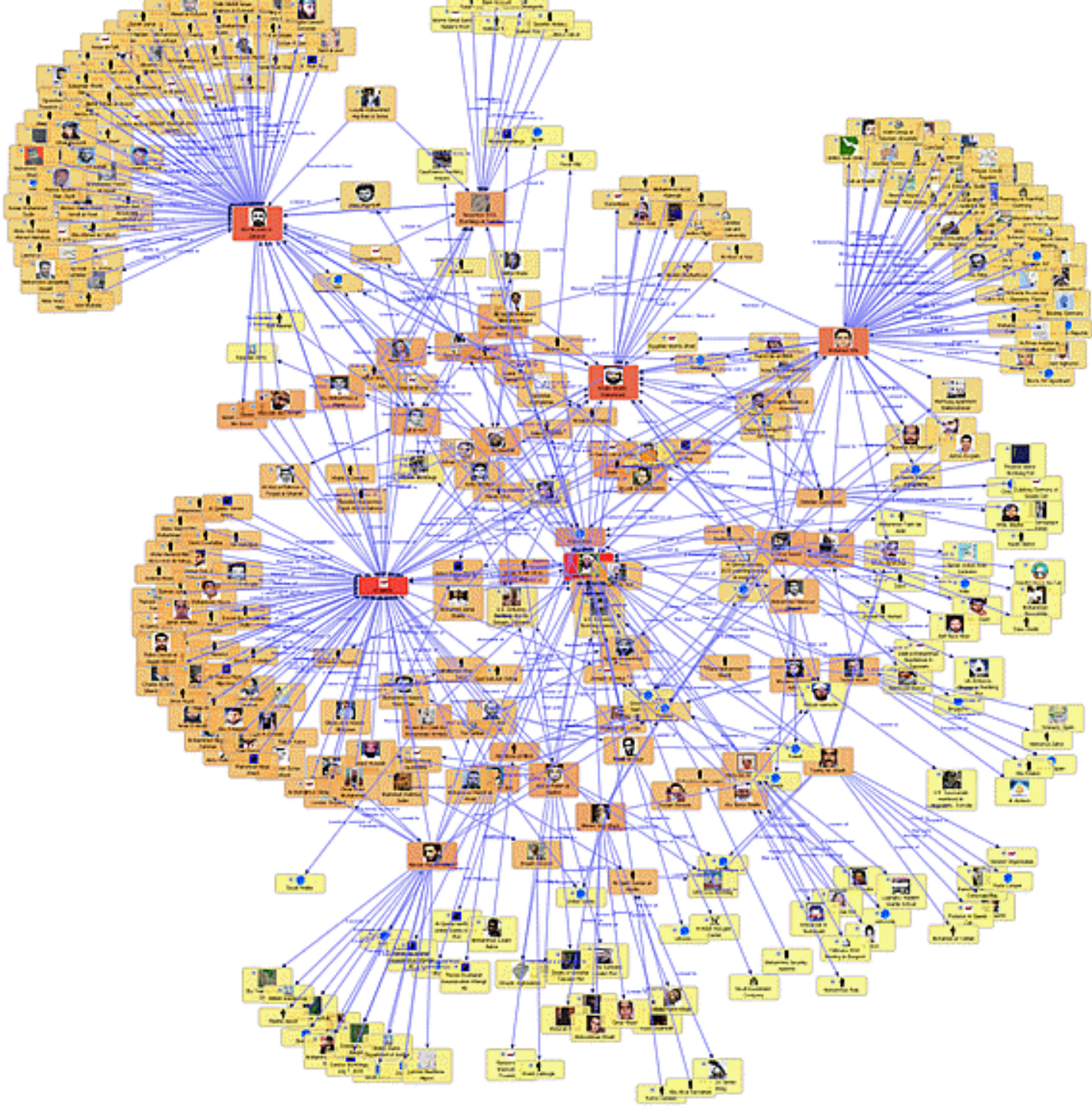


# Graphs

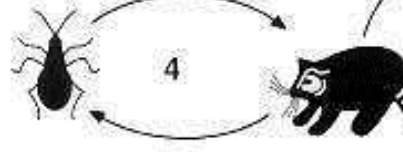
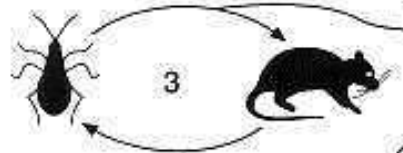
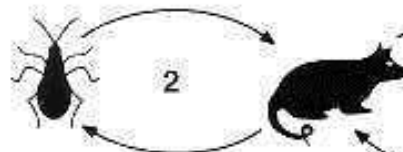
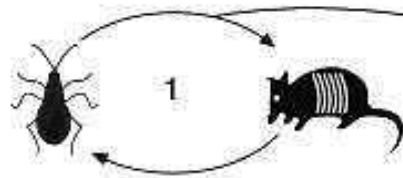
COMP 200 & COMP 130

John Greiner & Stephen Wong

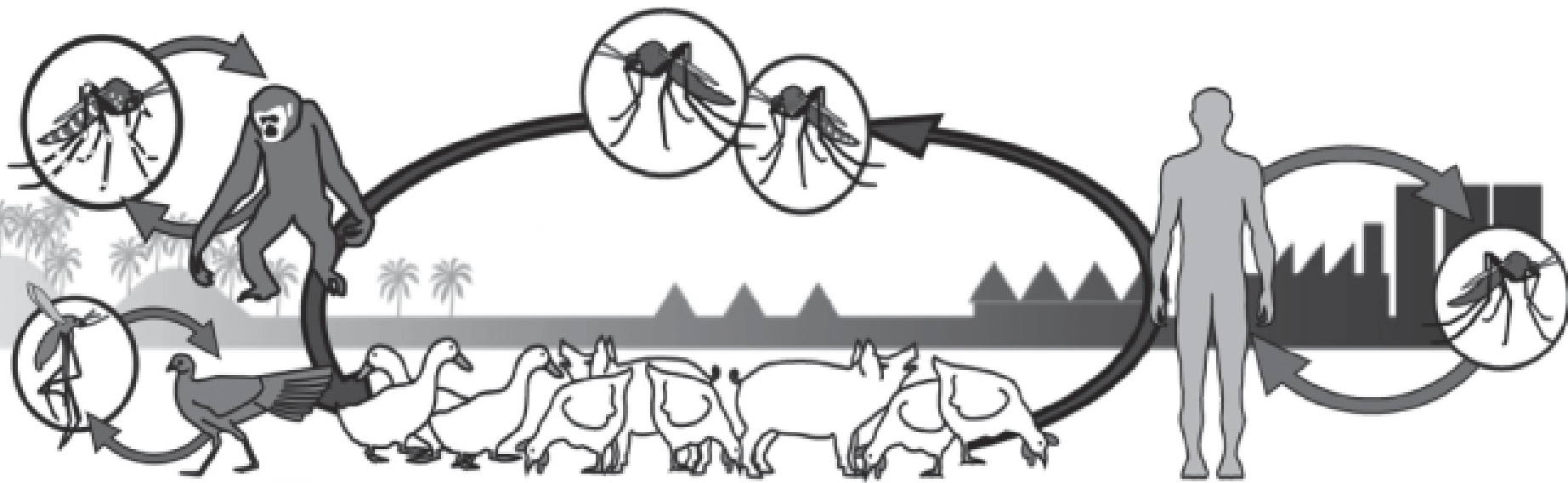
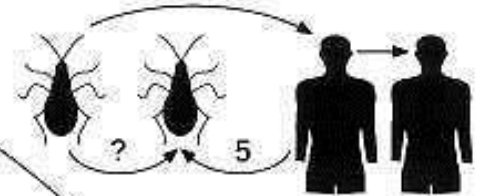




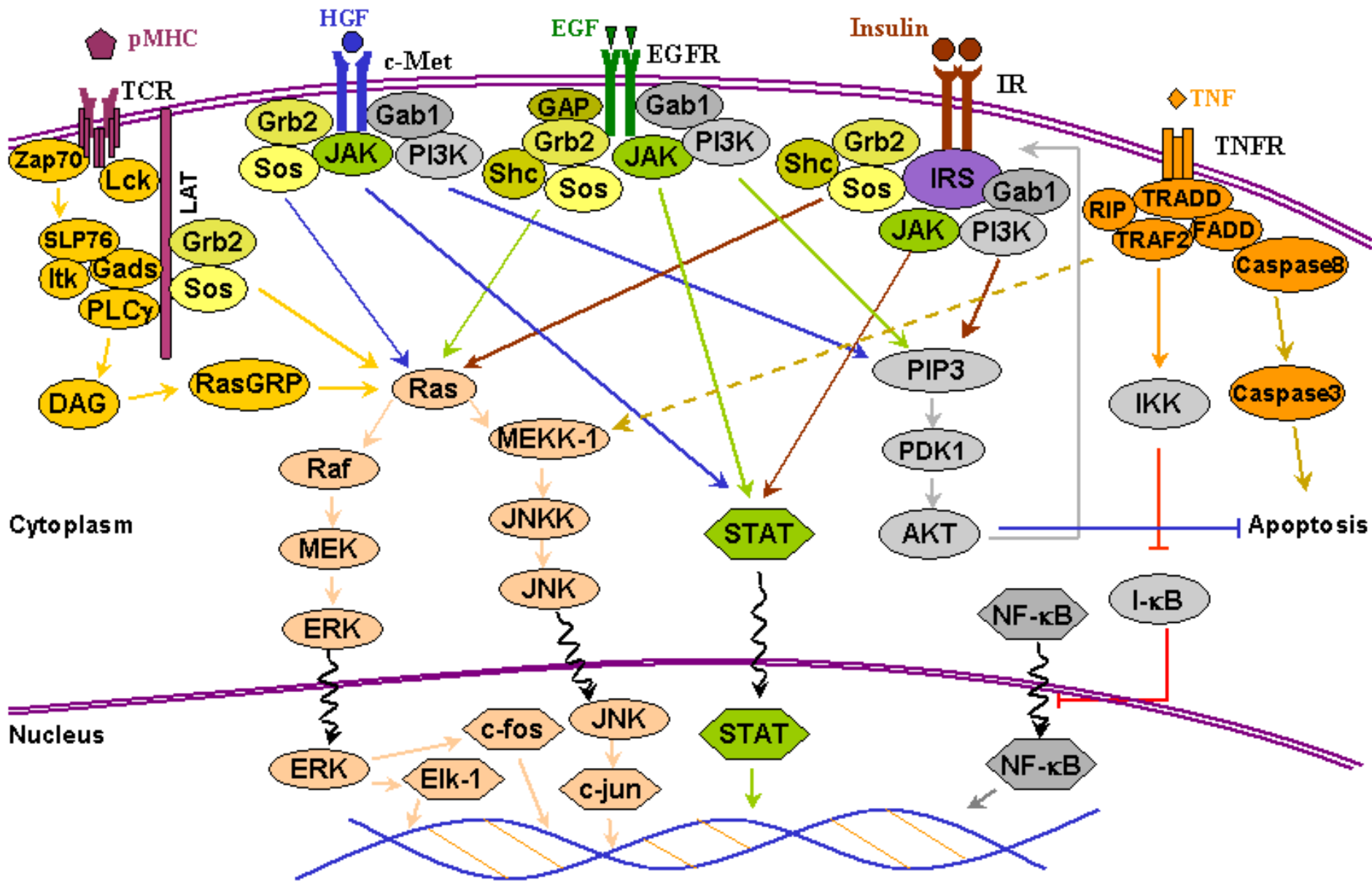
### Wild Cycles



### Domiciliary Cycles



# Apoptosis – Cellular Death Pathways



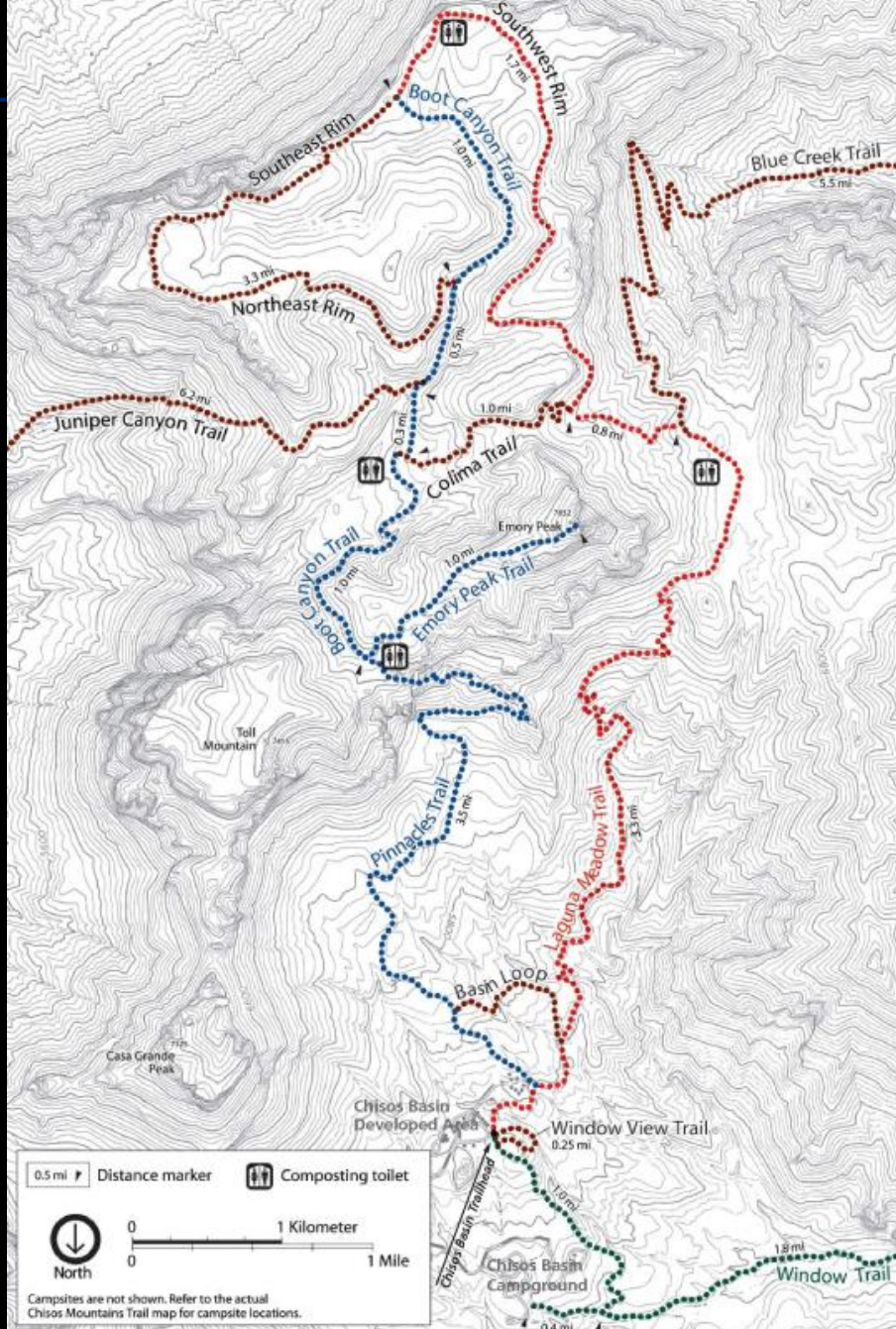




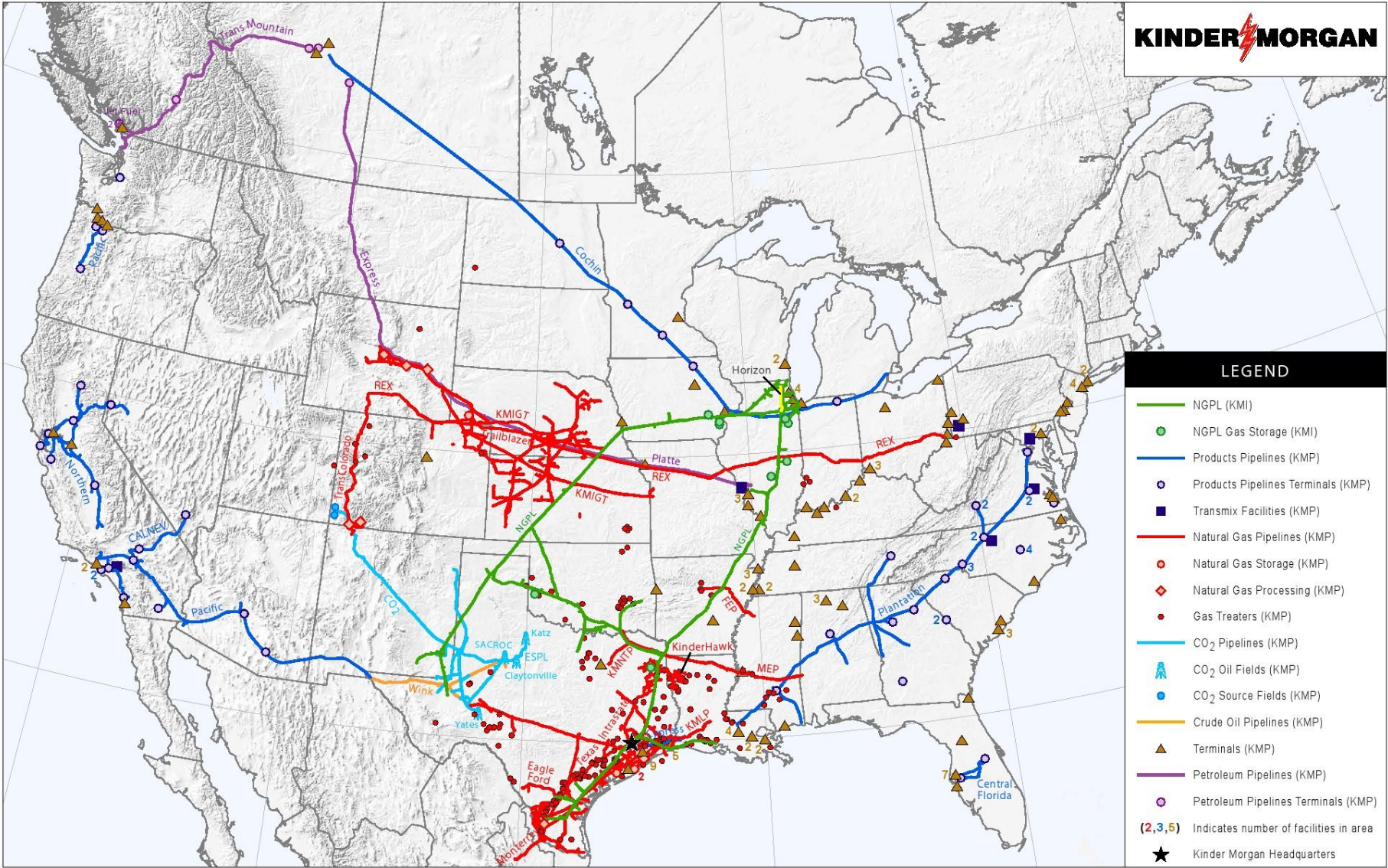




# High Chisos Trails System







**LEGEND**

- NGPL (KMI)
- NGPL Gas Storage (KMI)
- Products Pipelines (KMP)
- Products Pipelines Terminals (KMP)
- Transmix Facilities (KMP)
- Natural Gas Pipelines (KMP)
- Natural Gas Storage (KMP)
- ◇ Natural Gas Processing (KMP)
- Gas Treaters (KMP)
- CO<sub>2</sub> Pipelines (KMP)
- ⚙️ CO<sub>2</sub> Oil Fields (KMP)
- CO<sub>2</sub> Source Fields (KMP)
- Crude Oil Pipelines (KMP)
- ▲ Terminals (KMP)
- Petroleum Pipelines (KMP)
- Petroleum Pipelines Terminals (KMP)
- (2,3,5) Indicates number of facilities in area
- ★ Kinder Morgan Headquarters



# Visualizing The U.S. Electric Grid

The U.S. electric grid is a complex network of independently owned and operated power plants and transmission lines. Aging infrastructure, combined with a rise in domestic electricity consumption, has forced experts to critically examine the status and health of the nation's electrical systems.

THE GRID

SOURCES OF POWER

POWER PLANTS

SOLAR POWER

WIND POWER

## About This Map »

Click on the links below to switch layers on and off.

### EXISTING LINES


-  345-499 kV
-  500-699 kV
-  700-799 kV
-  1,000 kV (DC)

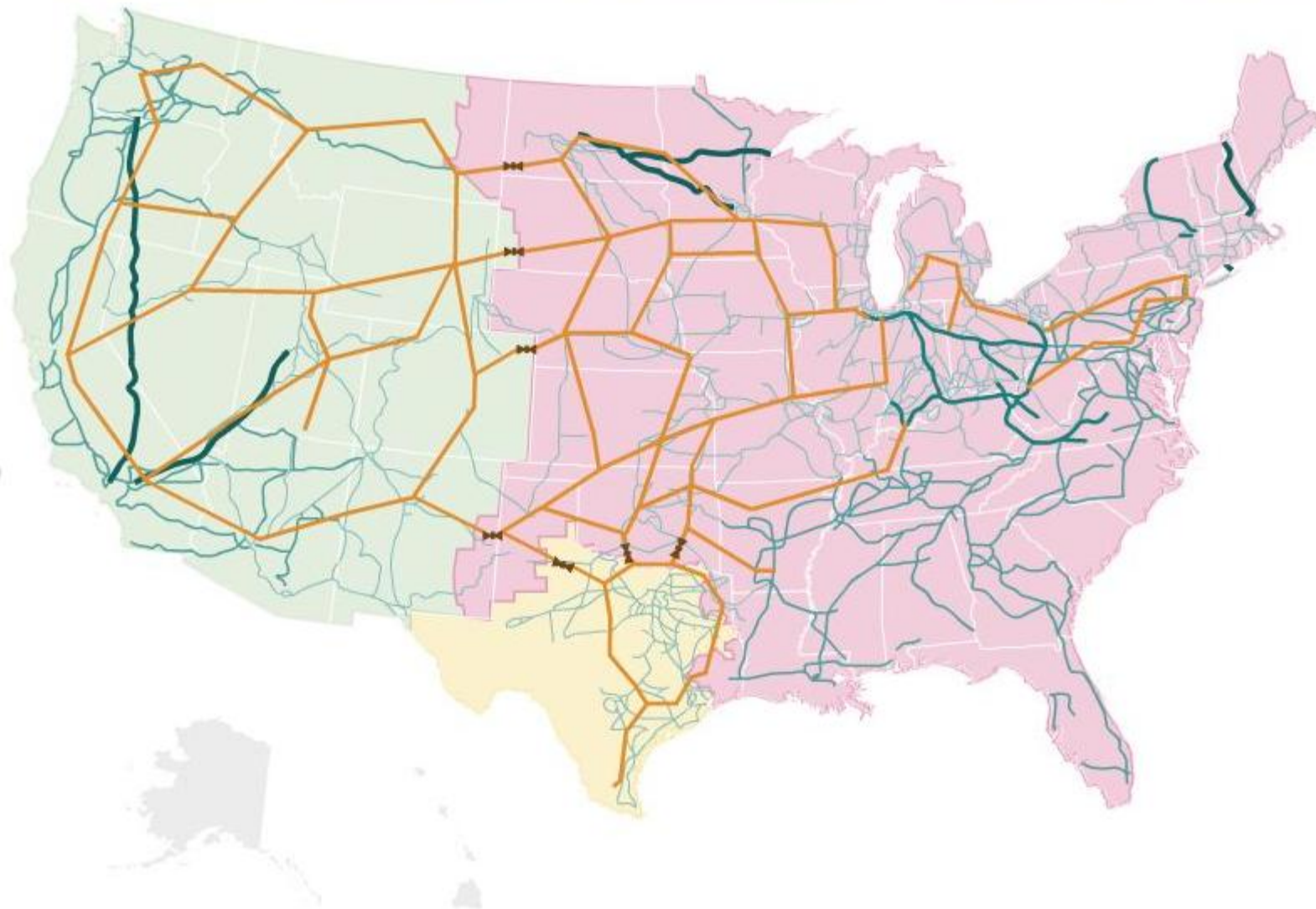
### PROPOSED LINES

-  New 765 kV
-  AC-DC-AC Links

### INTERCONNECTIONS

#### Major sectors of the U.S. electrical grid

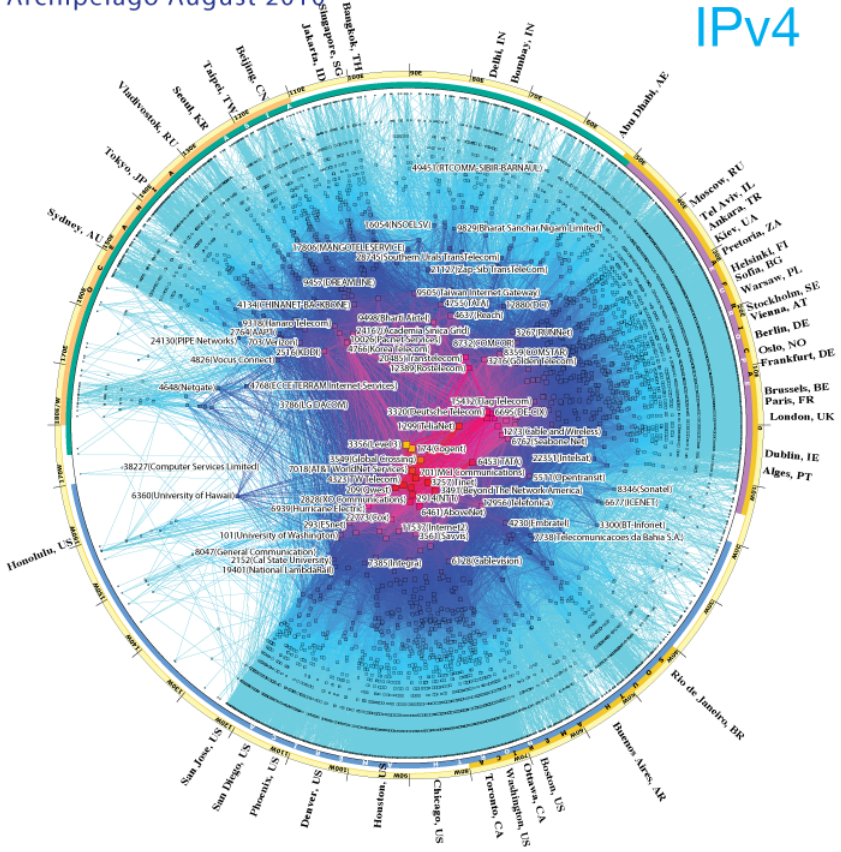
-  Eastern
-  Western
-  Texas (ERCOT)



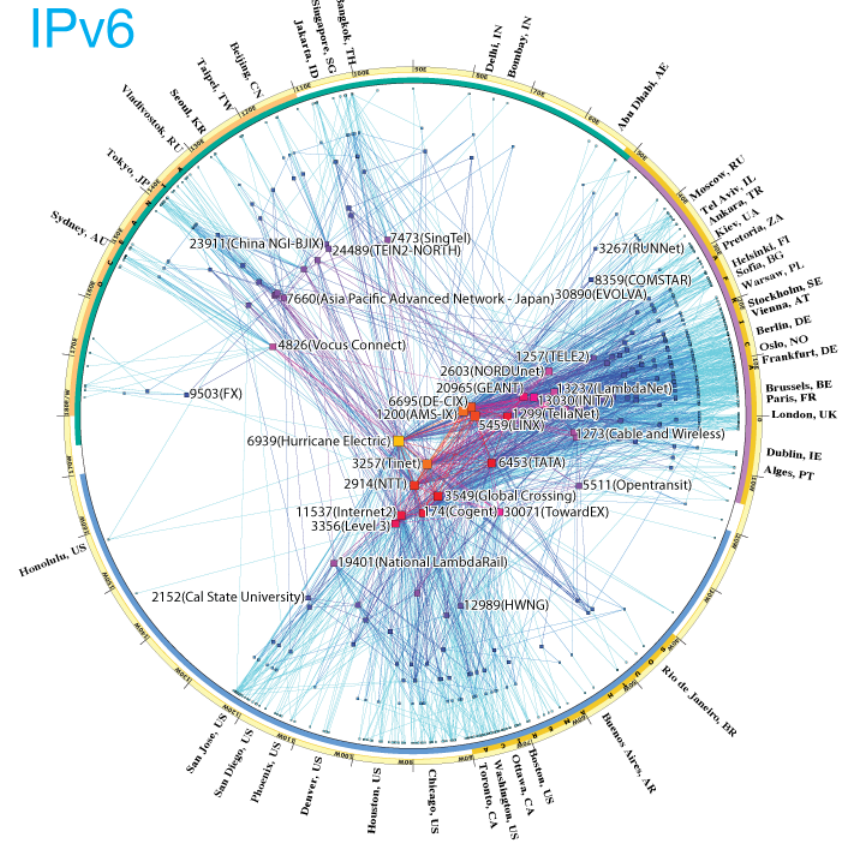
# CAIDA's IPv4 & IPv6 AS Core AS-level INTERNET GRAPH

Archipelago August 2010

IPv4



IPv6

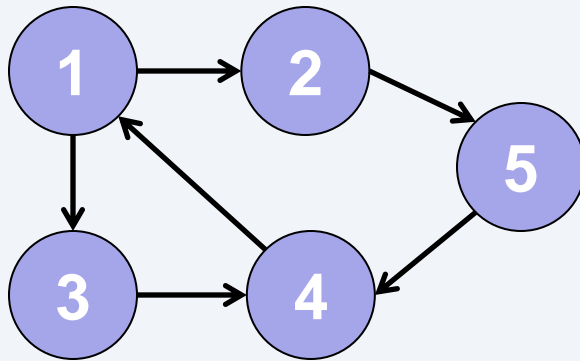


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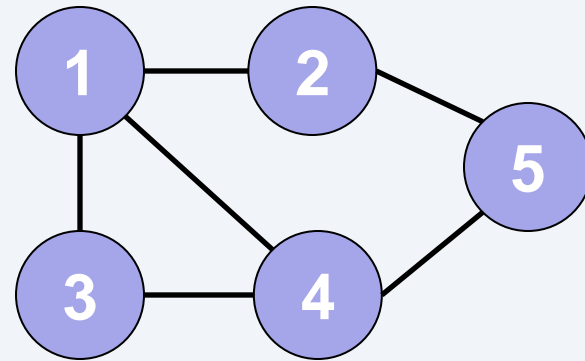


# Graphs (or Networks)

Vertices/nodes + edges connecting vertices

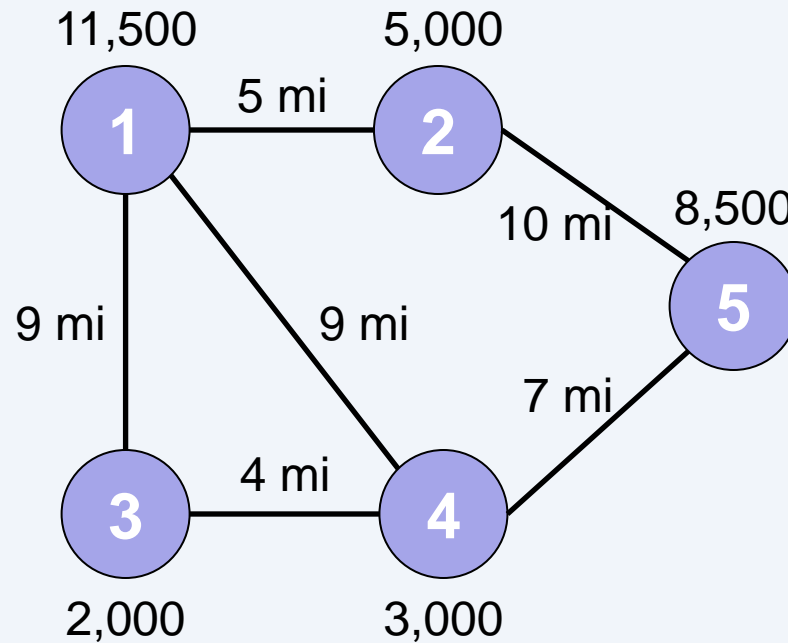


Directed



Undirected

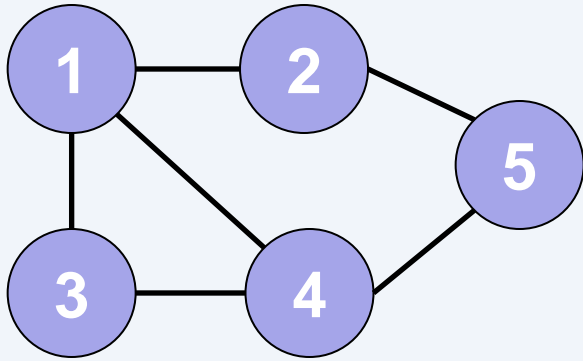
# Can Label/Annotate Nodes or Edges



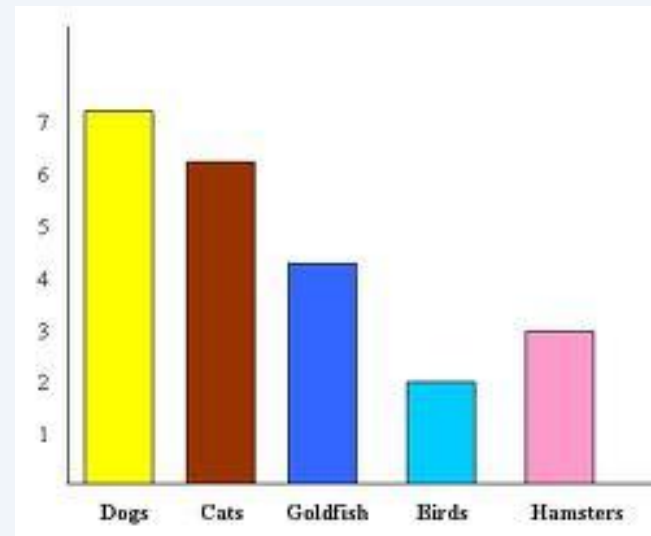
E.g., populations and distances



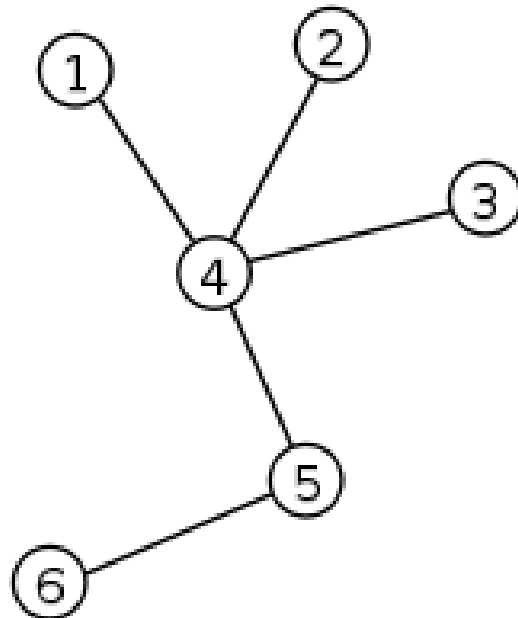
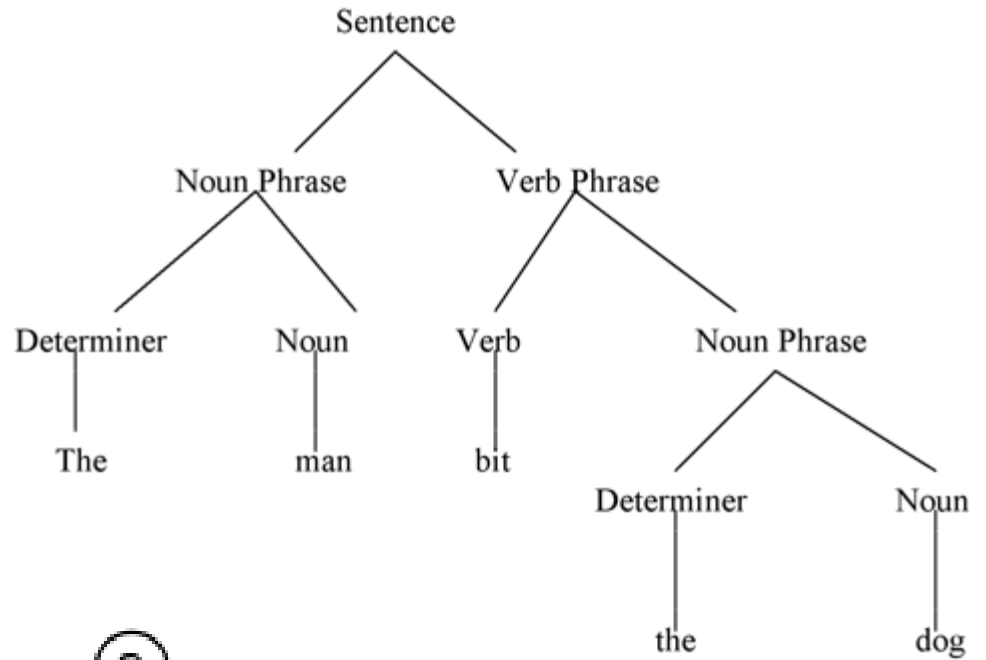
# Not the Same as Function Graphs



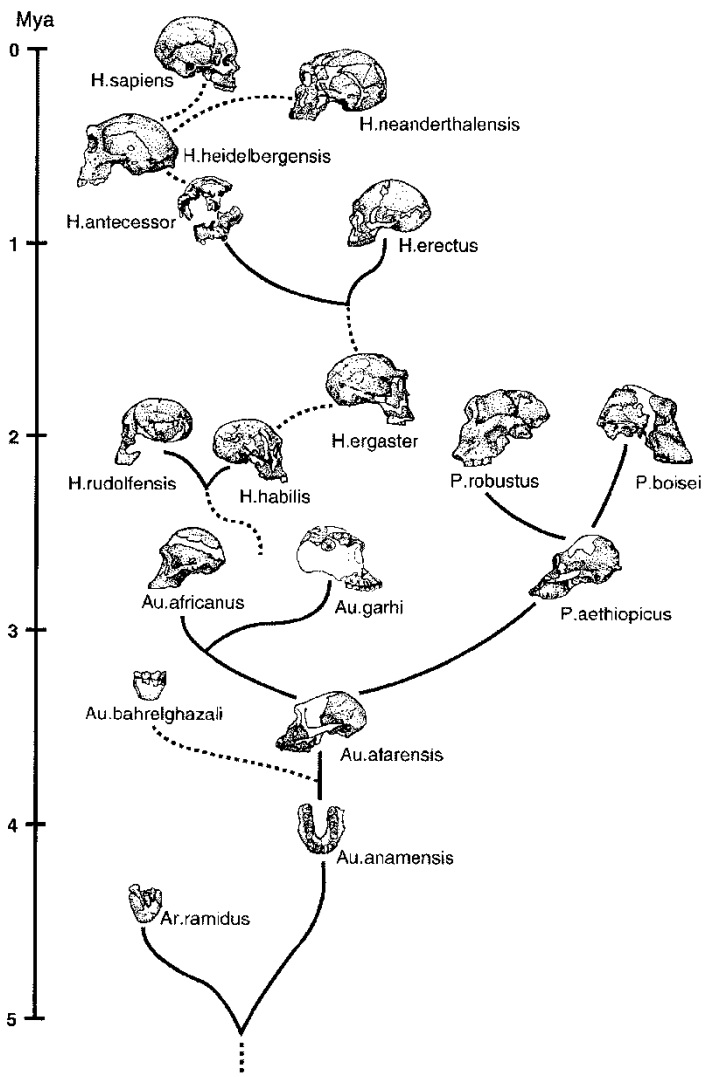
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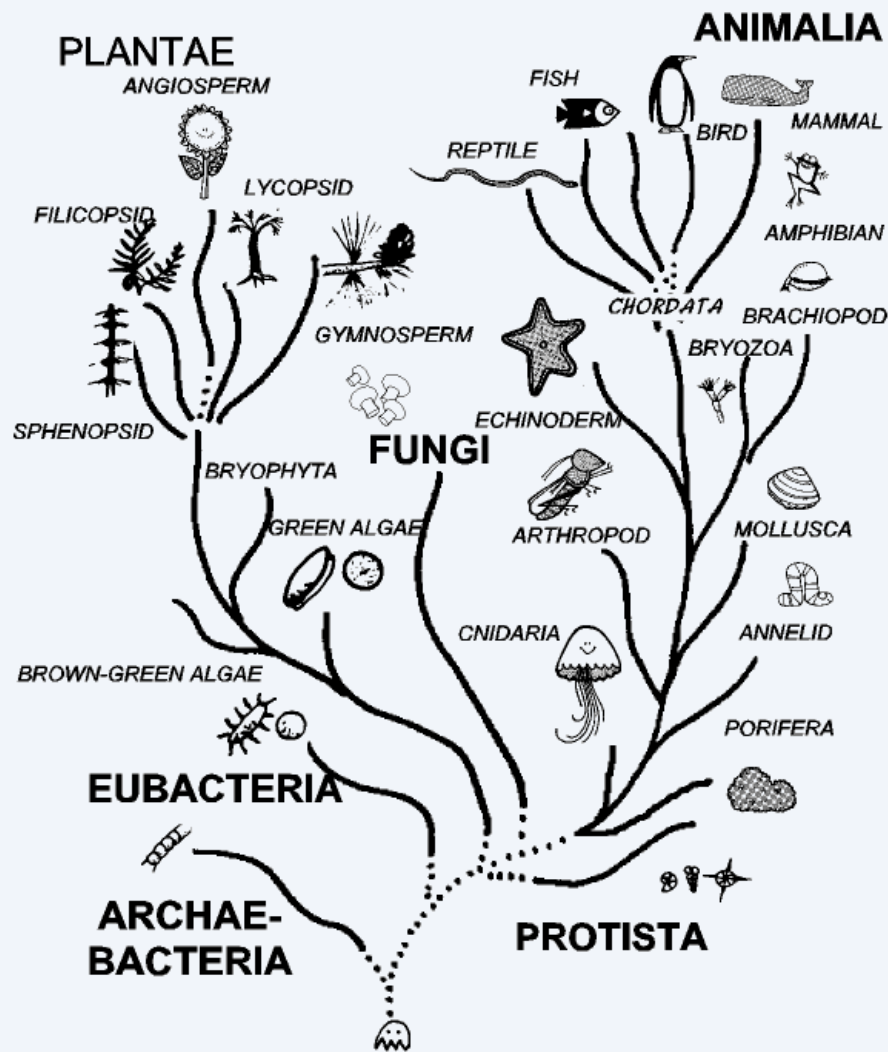
# Trees are Simple Graphs

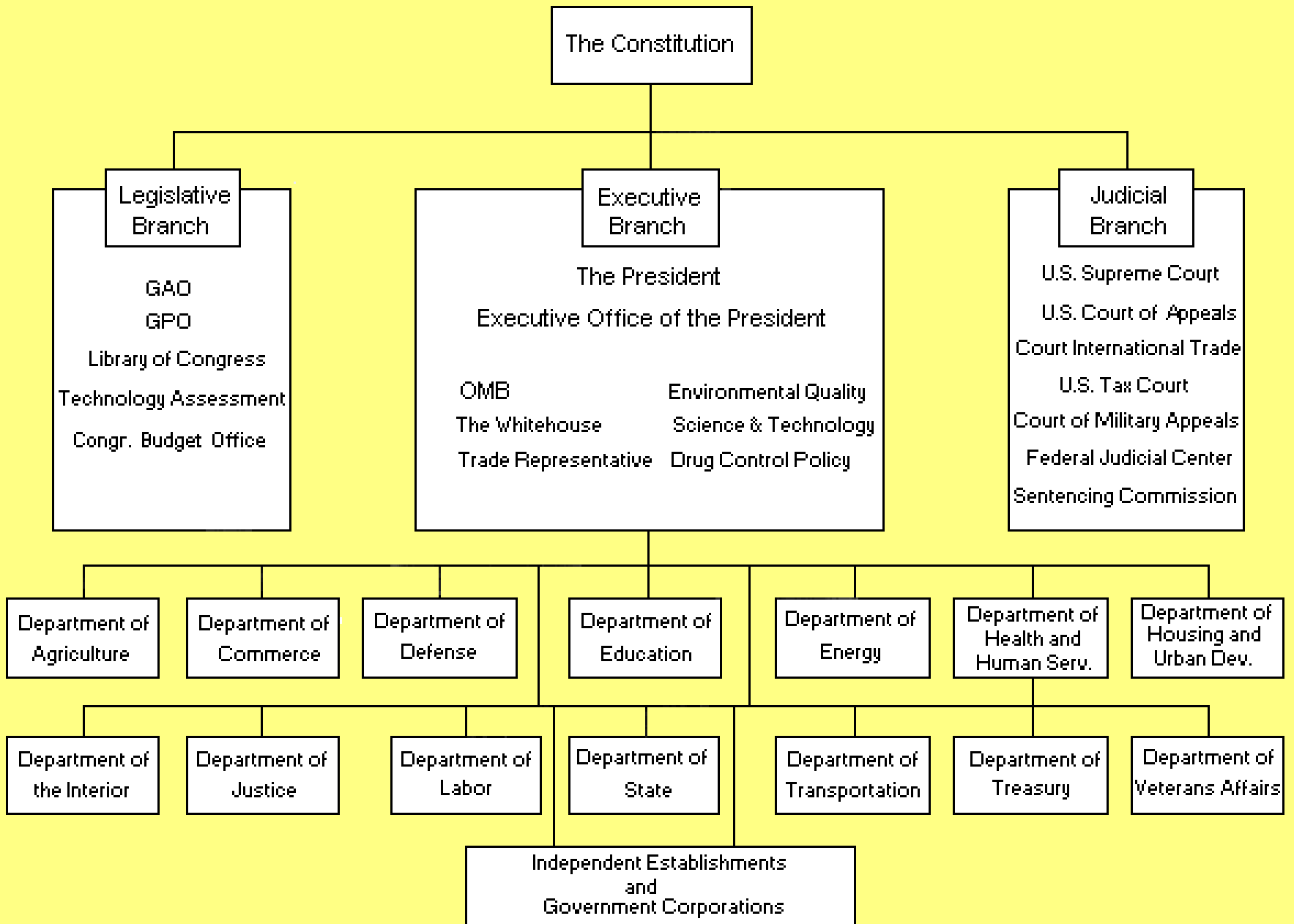




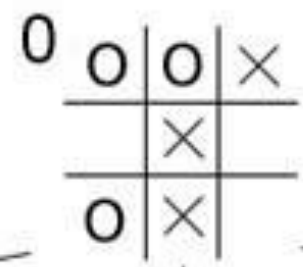


# TREE OF LIFE

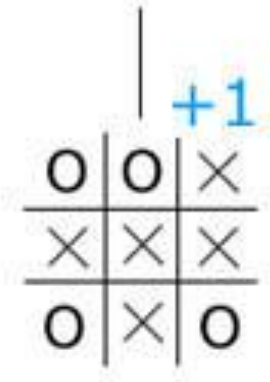
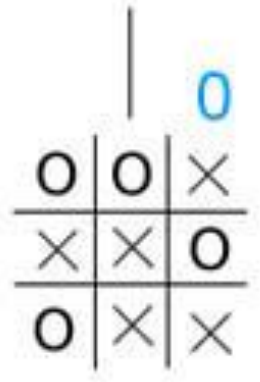
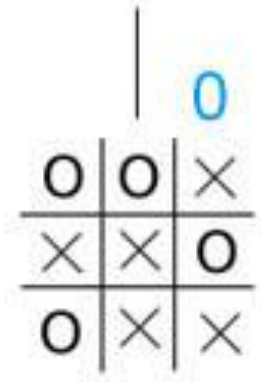
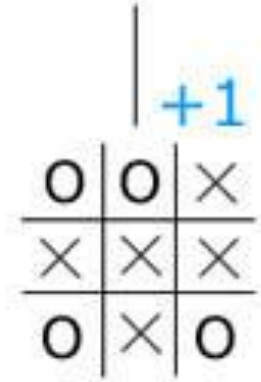
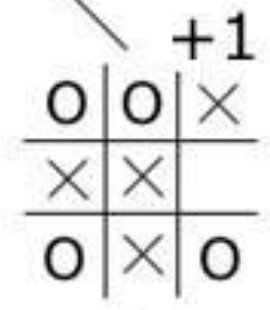
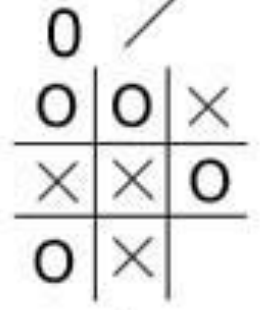
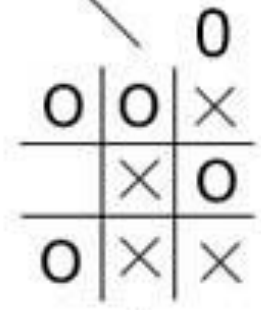
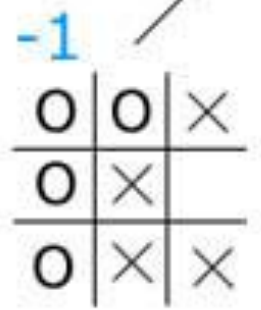
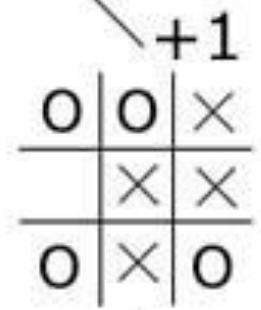
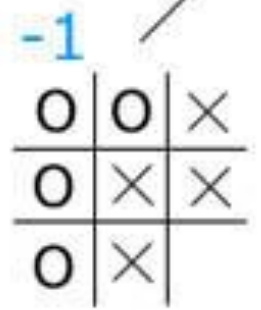
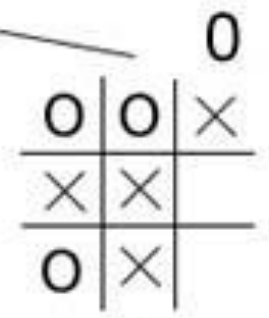
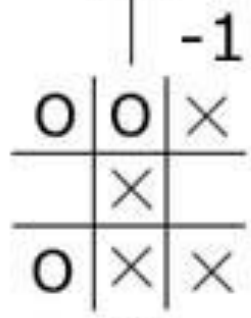
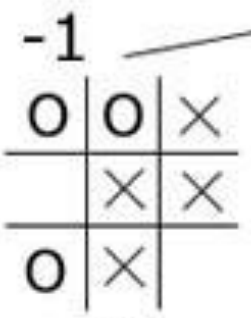


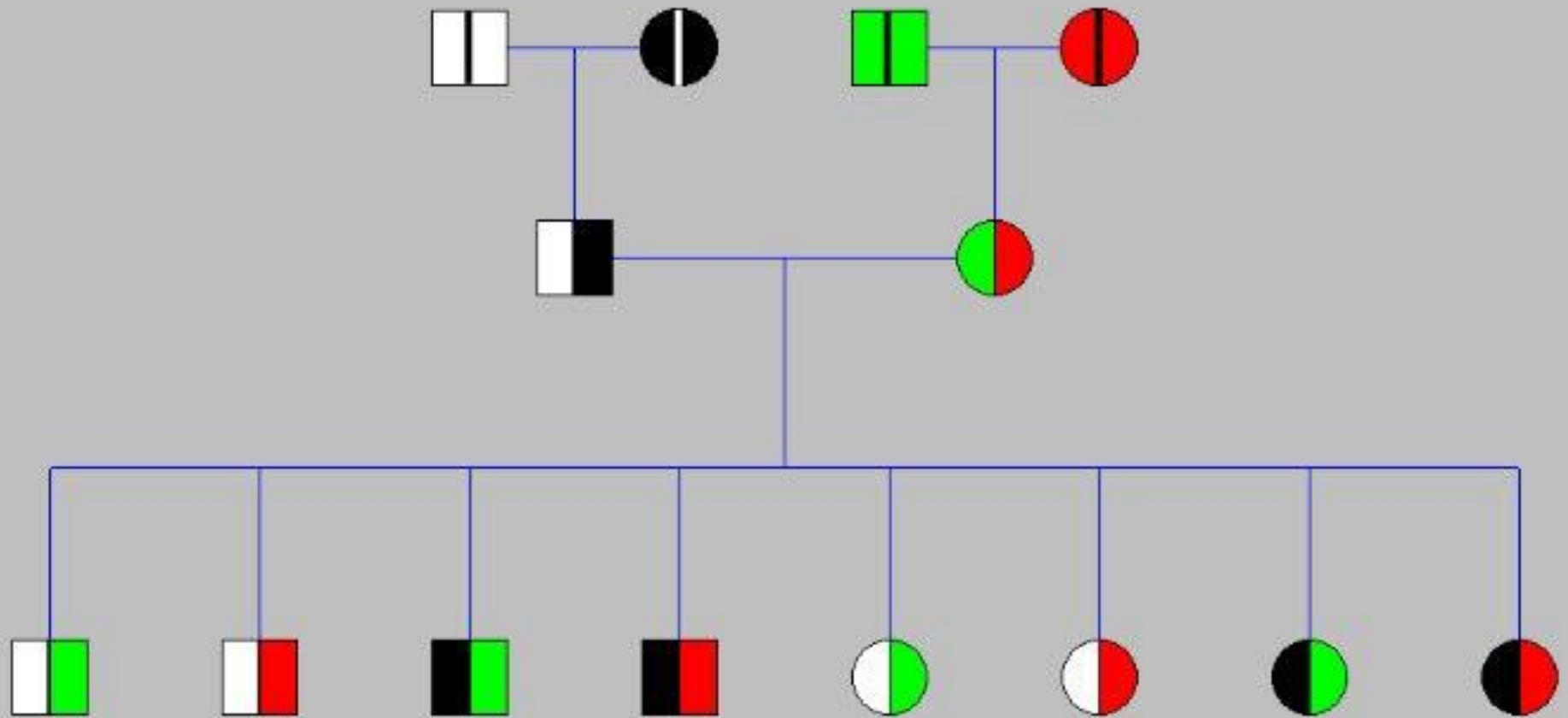




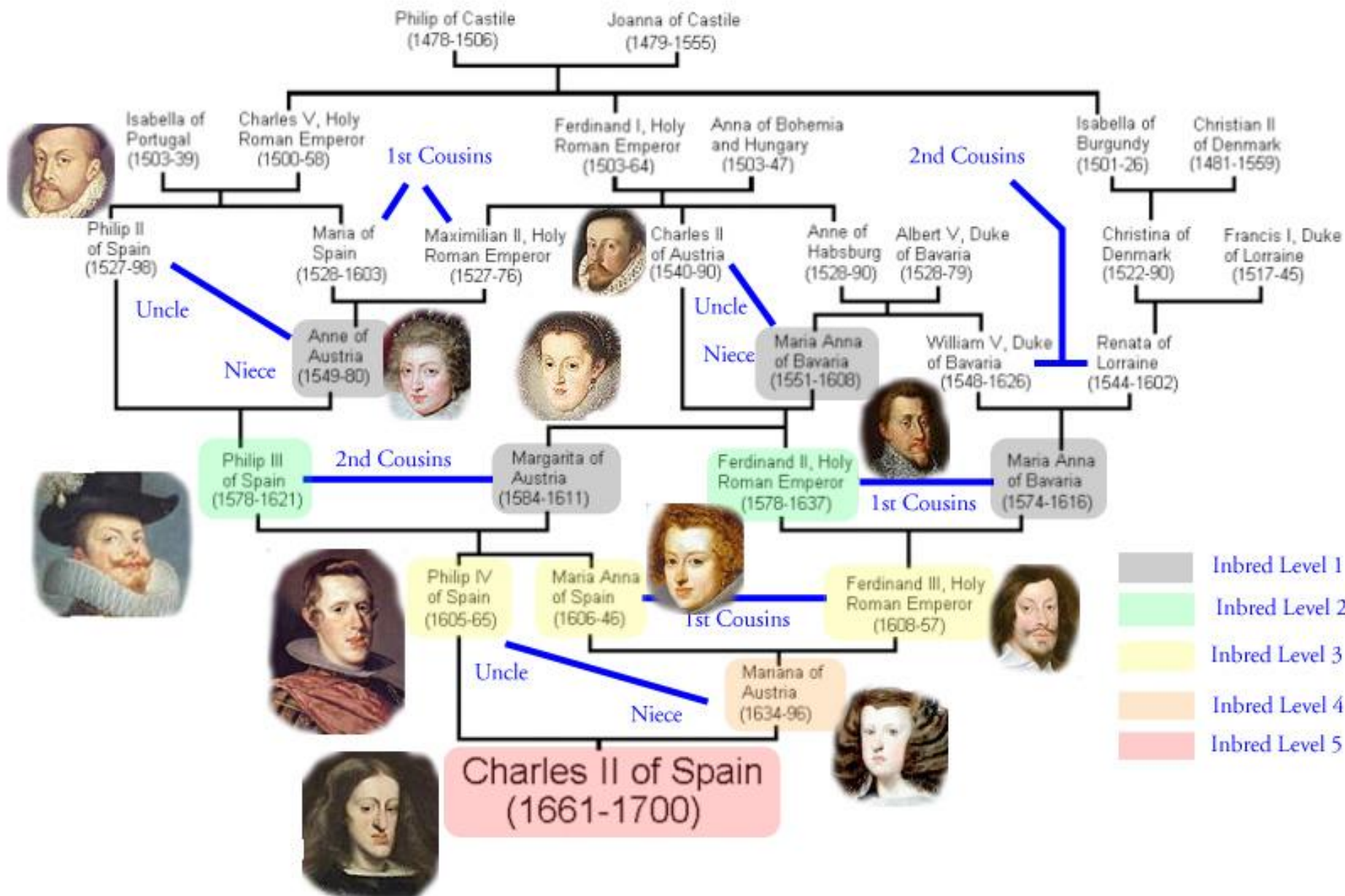


X's turn (MAX)

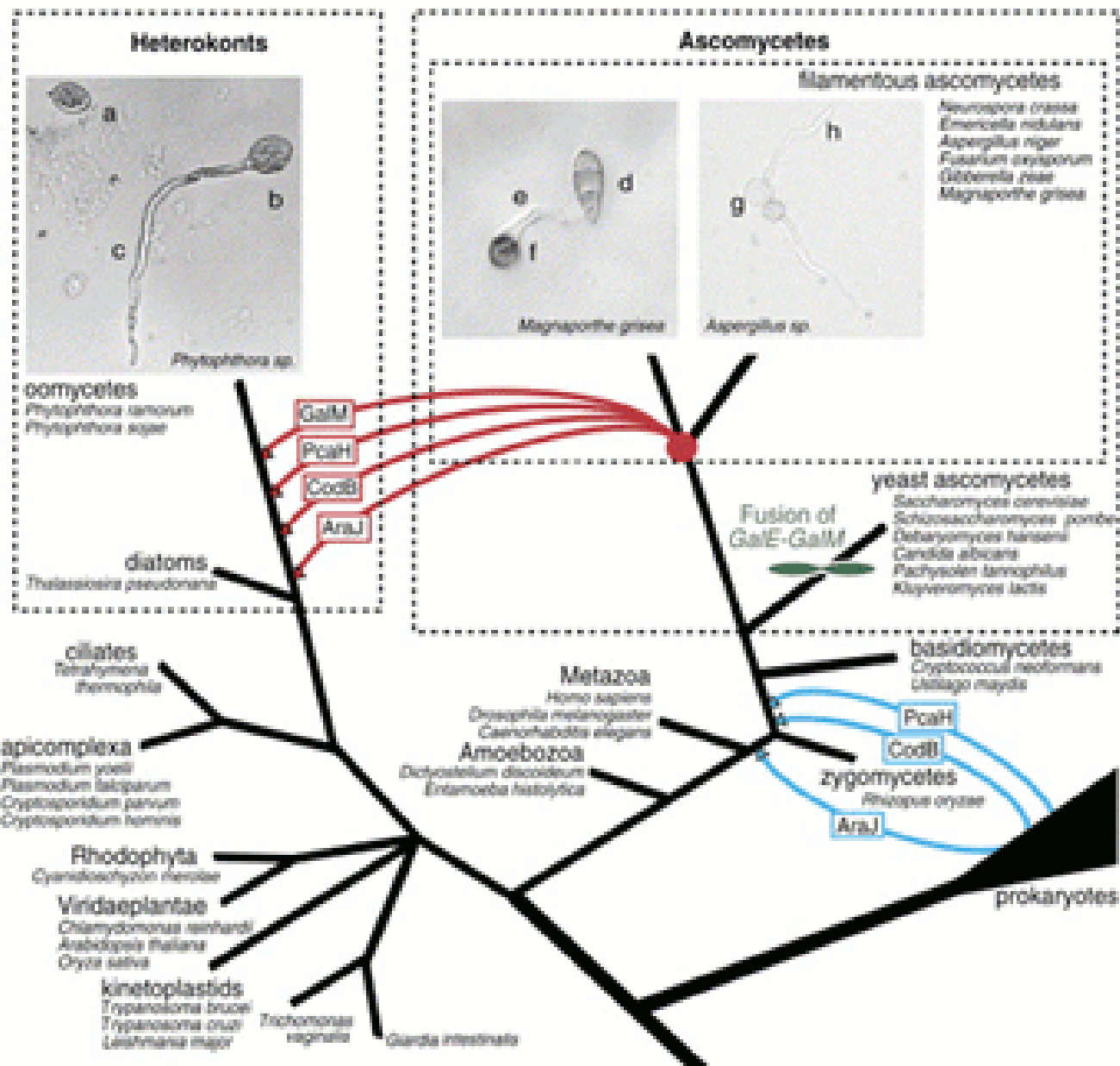




# The Inbreeding of Charles II of Spain (1661-1700)







Horizontal Gene Transfer between filamentous osomotrophic plant pathogens. See Richards et al., 2006 Curr. Biol. 15, 1857-64 for more details