An Analytical Perspective

CHEM 370
Harvey Ch 1

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Western Carolina University | AP 342

Some Example Equations

Basic Math

$$y = mx + b$$

Chemical Equations in an `align` Environment

$$\begin{aligned} \mathrm{O_3} + h\nu &\longrightarrow \mathrm{O_2} + \mathrm{O(^1D)} \\ \mathrm{O(^1D)} + \mathrm{O_2} + \mathrm{M} &\longrightarrow \mathrm{O_3} + \mathrm{M} \\ \mathrm{O(^1D)} + \mathrm{H_2O} &\longrightarrow 2\,\mathrm{OH} \end{aligned}$$

Some Example Code

Julia

```
fruits = ["apple", "banana", "cherry"]
for (i, s) ∈ enumerate(fruits)
    println(s)
    sleep(1)
end
```

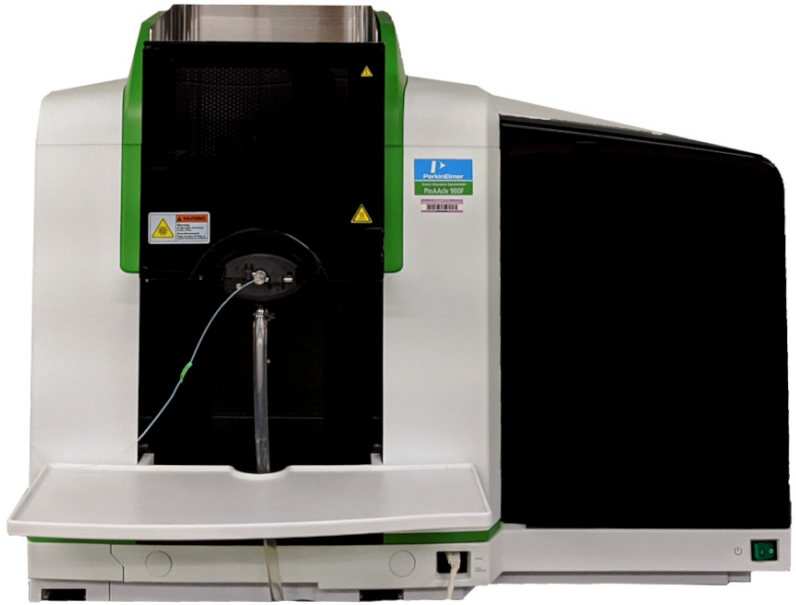
Python

```
import time
fruits = ["apple", "banana", "cherry"]
for x in fruits:
    print(x)
    sleep(1)
```

What is analytical chemistry?

To an analytical chemist **the process of making a useful measurement is critical**; *if the measurement is not of central importance to the work, then it is /not* analytical chemistry./
-David Harvey, *Analtyical Chemistry 2.1*

What is an ‘Instrument’?



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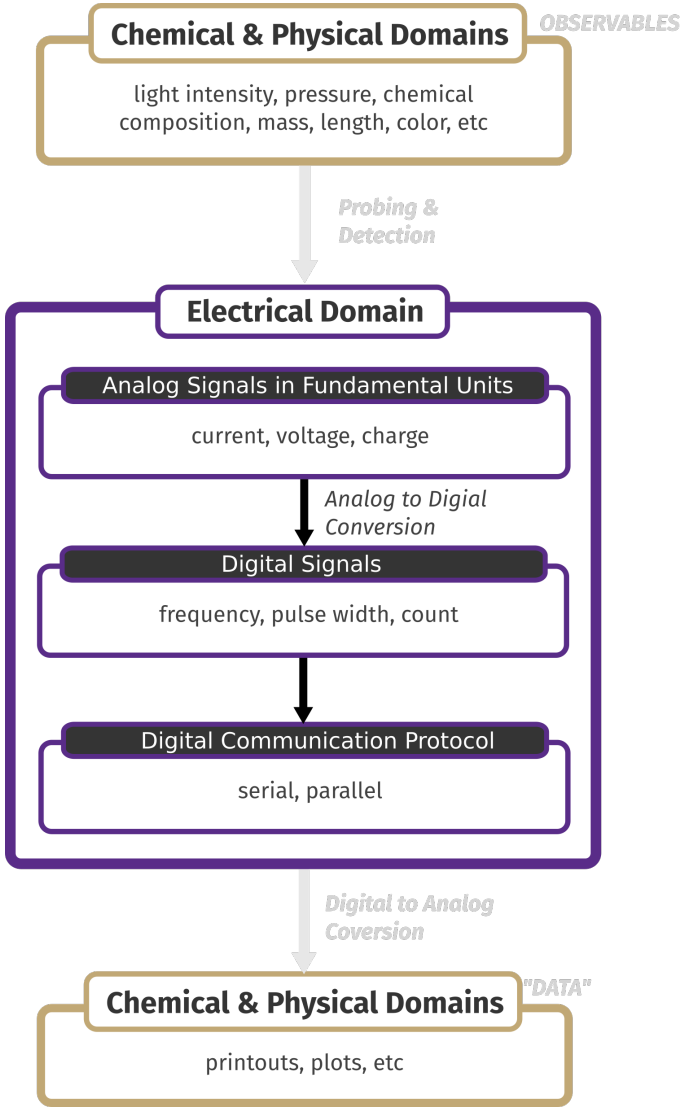
Information Flow



Course Content

- Topics covered
  - **Foundations**: Quantitative analysis and statistical treatment of data
  - **Spectroscopy** (Molecular and atomic)
  - **Mass Spectrometry**
  - **Separations** (Chromatography)
- Why are these techniques important?
  - Data literacy / rigorous treatement of data / strong conclusions
  - Techniques used in Forensics, Environmental analysis, Pharmaceutical / drug discovery / natural products, Geology / mining, Materials science, Biology / biochemistry, ...
- We will focus on **chemical analysis** but will also work on some **analytical chemistry** problems.

A closing thought

As we introduce new techniques, it is important that you incorporate them into the context of the techniques with which you are already familiar.
-Granger et al, *Instrumental Analysis*