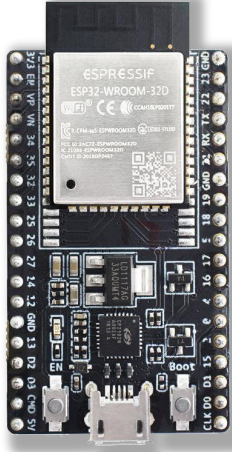# SPACE WEATHER STATION

Why do you need friends when you can code.
© Aleksi Myllymäki

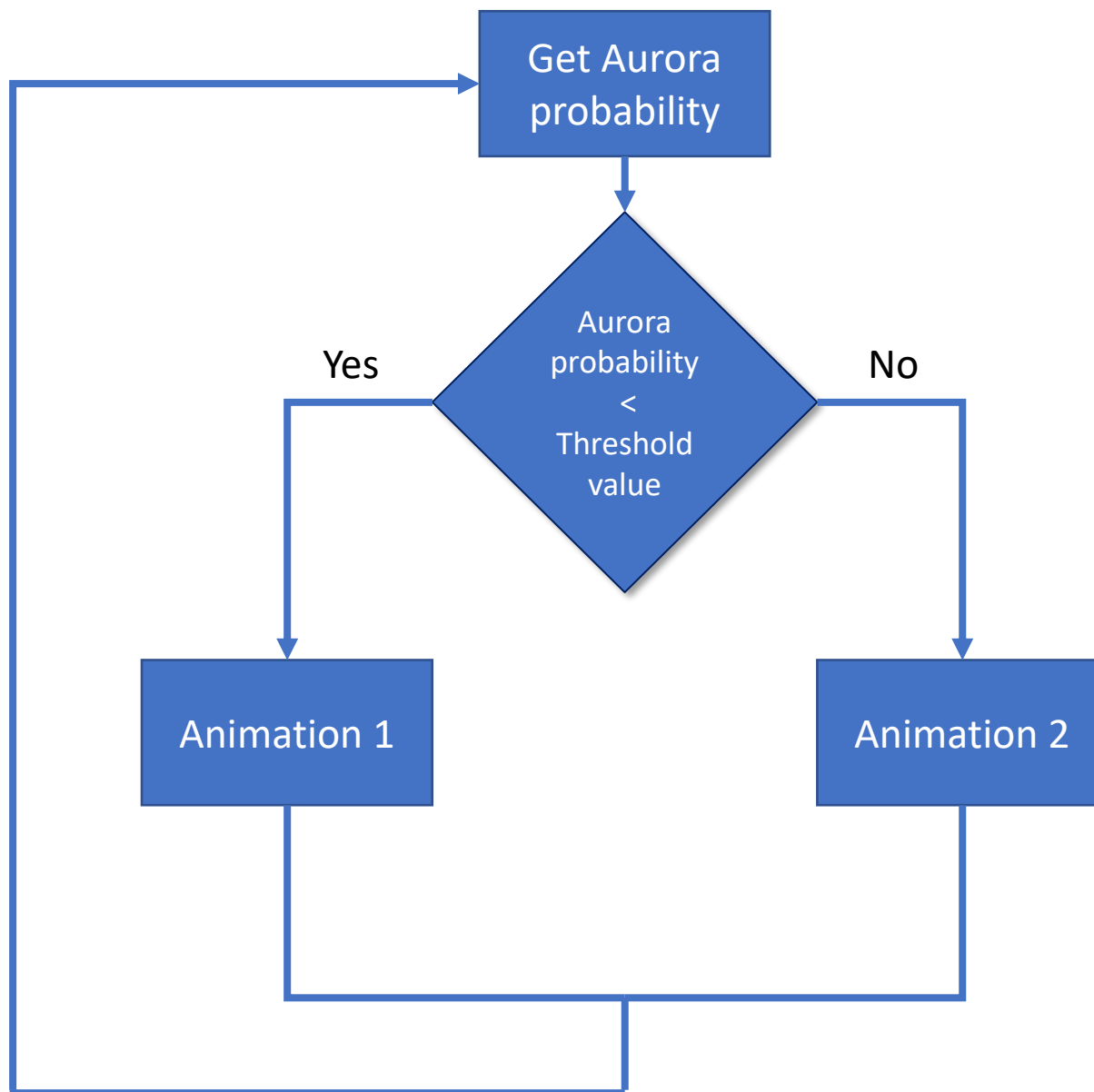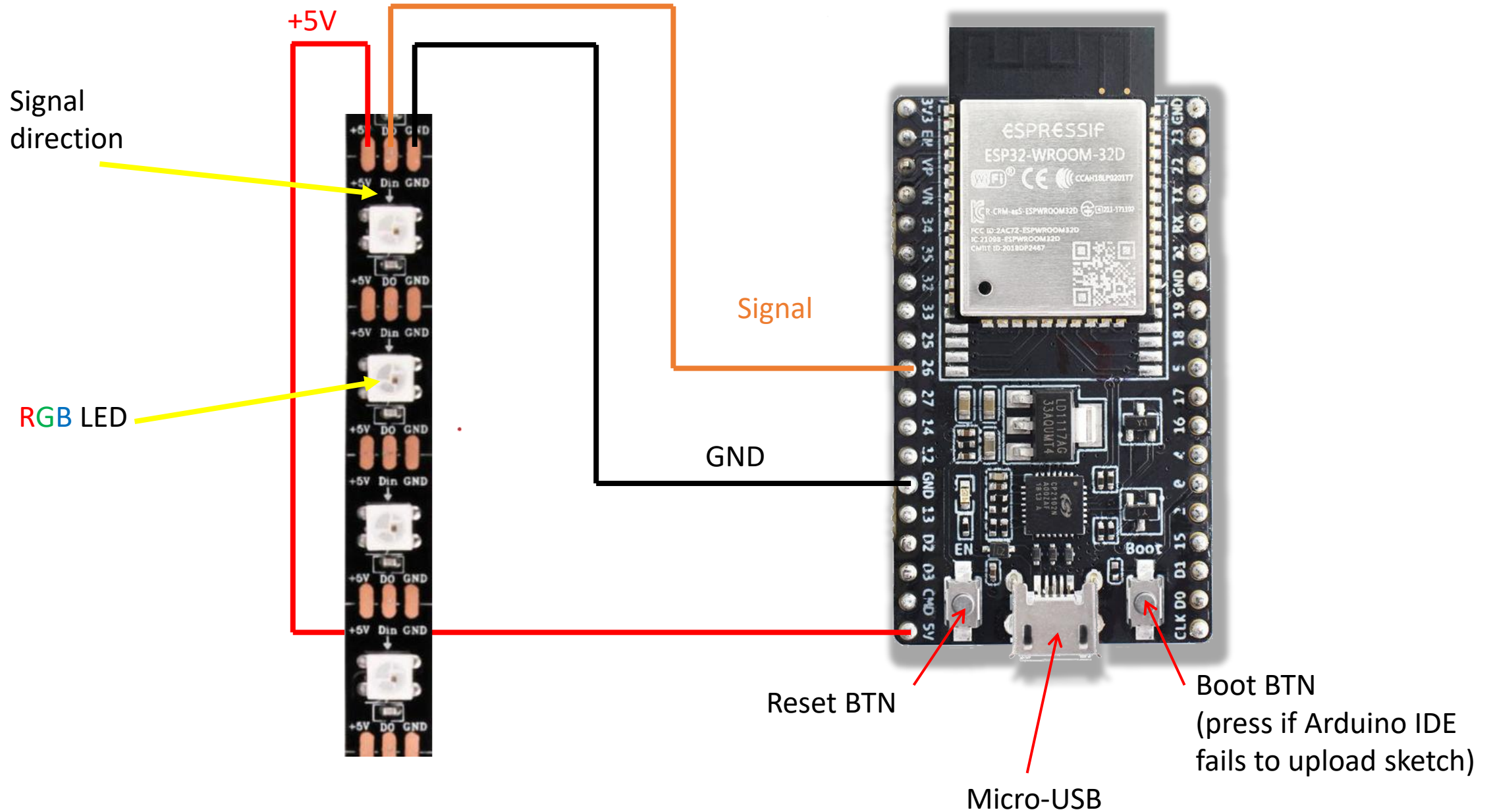ESP32   Wi-Fi   Internet   https://www.noaa.gov

+5V

Signal direction

RGB LED

Signal

GND

Reset BTN

Micro-USB

Boot BTN
(press if Arduino IDE
fails to upload sketch)

111111110000000000000000   000000000000000000000000   000000001111111100000000   000000000000000000000000   000000000000000011111111

24bits   3 BYTES   24bits   3 BYTES   24bits   3 BYTES   24bits   3 BYTES   24bits   3 BYTES

000000000000000000000000   000000001111111100000000   000000000000000000000000   000000000000000011111111

24bits   24bits   24bits   24bits

000000001111111100000000   000000000000000000000000   000000000000000011111111

24bits   24bits   24bits

000000000000000000000000   000000000000000011111111

24bits   24bits

000000000000000011111111
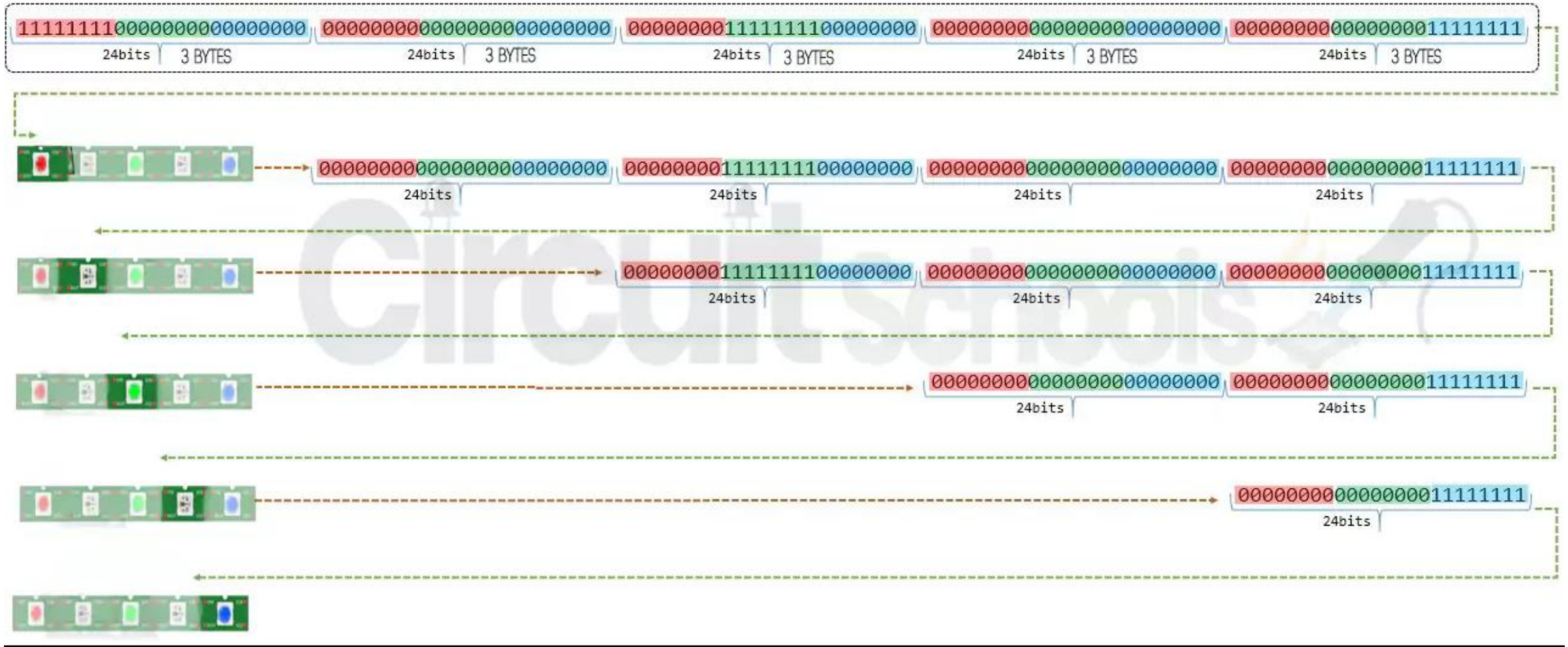
24bits

Normal Arduino Sketch structure

```
Variable declaration section
        #include <Adafruit_NeoPixel.h>
        #define PIN 6
        #const int LED_NUM = 4;
        #Adafruit_NeoPixel strip = Adafruit_NeoPixel(LED_NUM, PIN, NEO_GRB + NEO_KHZ800);
```

```
void setup(){
        //(part of the code that runs only once)
        Serial.begin(115200);
}
```

```
void loop(){
        //(part of the code that runs only once)
        if (making_thigs == "awseome")
                do_something();
        else
                do_nothing();
}
```

```
Function section
Void do_something(){
        some code here
}
```

Aurora Code structure

Variable declaration section
        Include libraries, declare global variables and constants,
        Create object "strip" to run Neopixeles,
        Declare Tasks and Queue

```
void setup(){
        start Serial port for debugging
        setup tasks
        setup Queue
}
```

Core 0
```
void readAuroraCode(){
        connect to Wi-Fi
        for (;;){    // repeat forever
                auroraState = readAurora();
                send auroraState to Queue;
                wait 30 seconds;
}
```

auroraState

Queue

Core 1
```
void runNeopixelCode{
        for(;;){
                if auroraState < threshold
                        play Animation 1
                else
                        play Animation 2
        }
}
```

```
void loop(){
}
```

Function section.
void readAurora()
LED animations, etc.