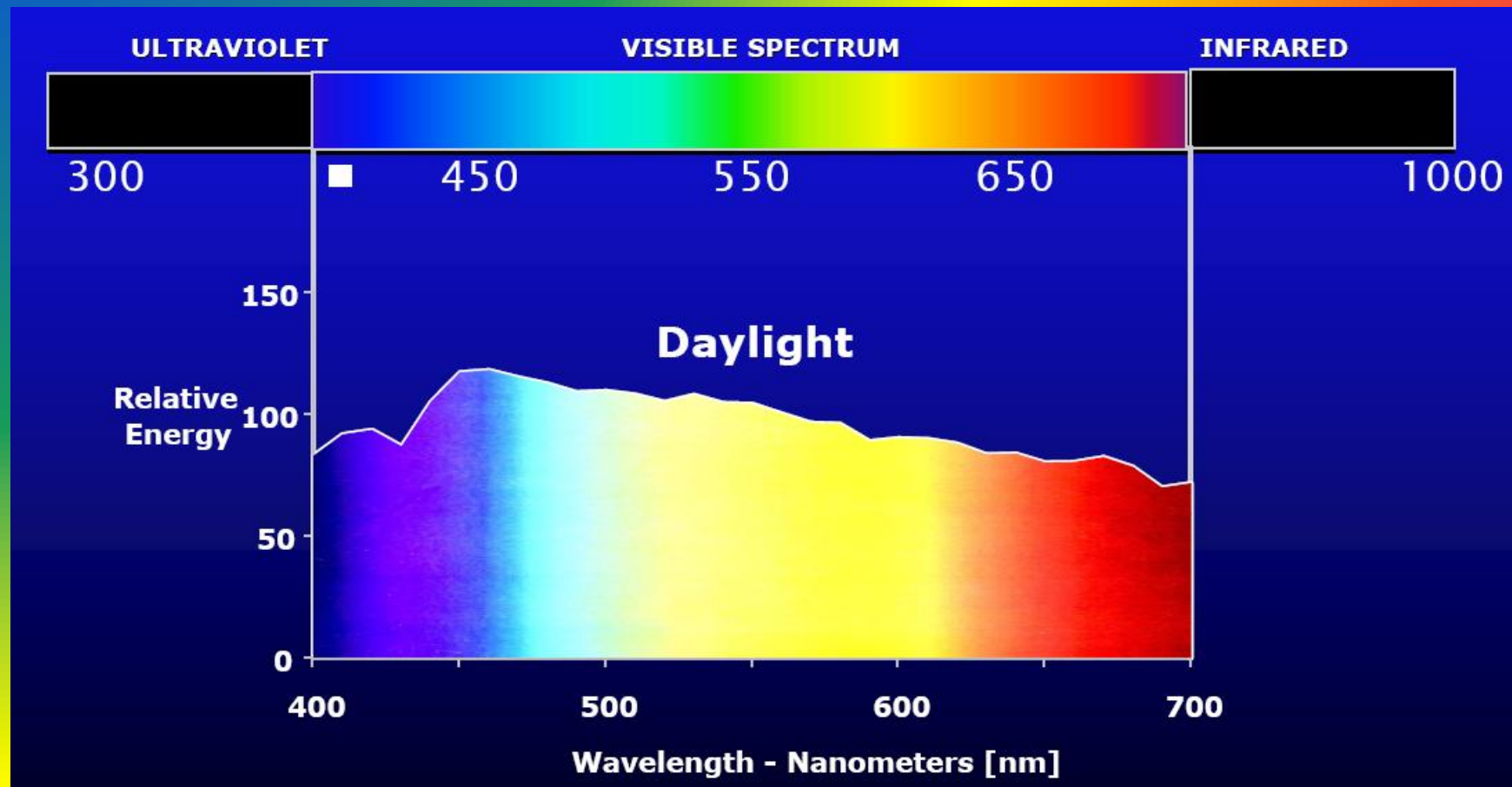


Luce del giorno



Vediamo la luce non assorbita

Grafico di riflettanza spettrale di una mela

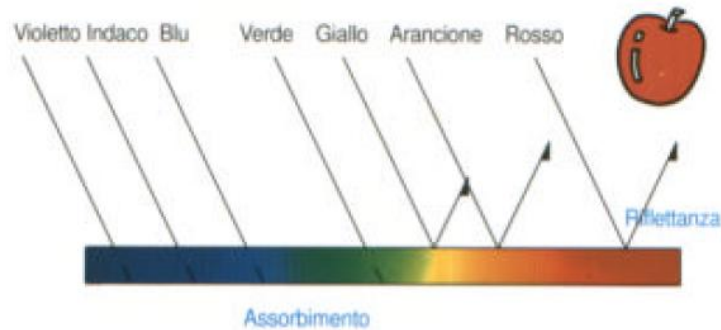
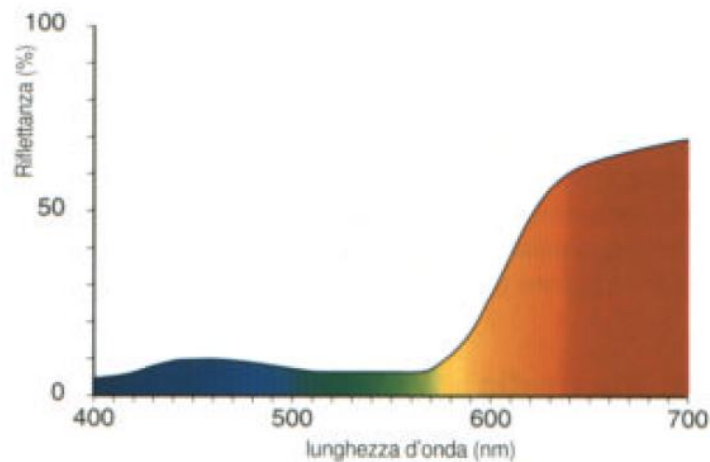
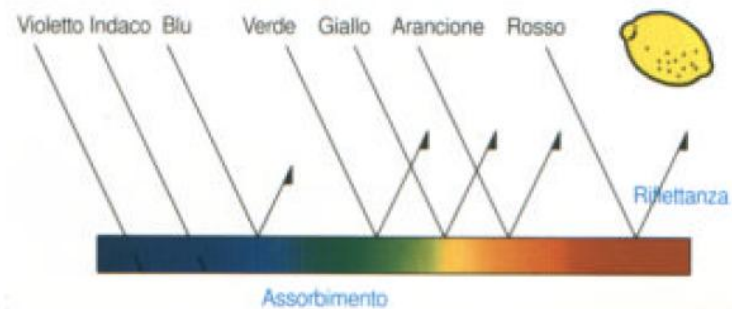
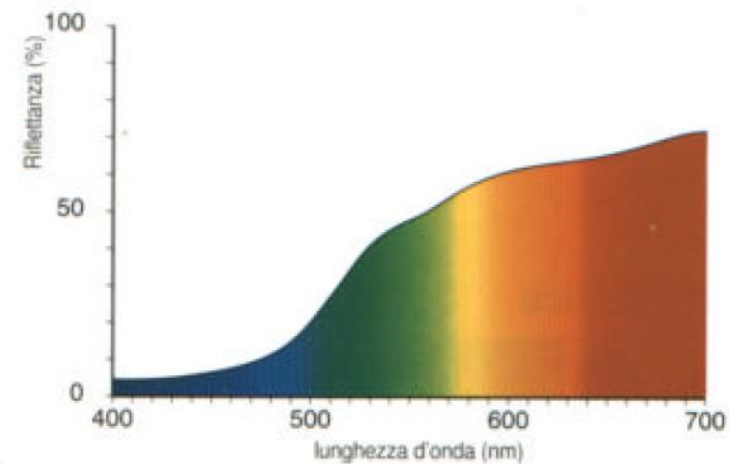


Grafico di riflettanza spettrale di un limone



Cosa vuol dire “vedere”?

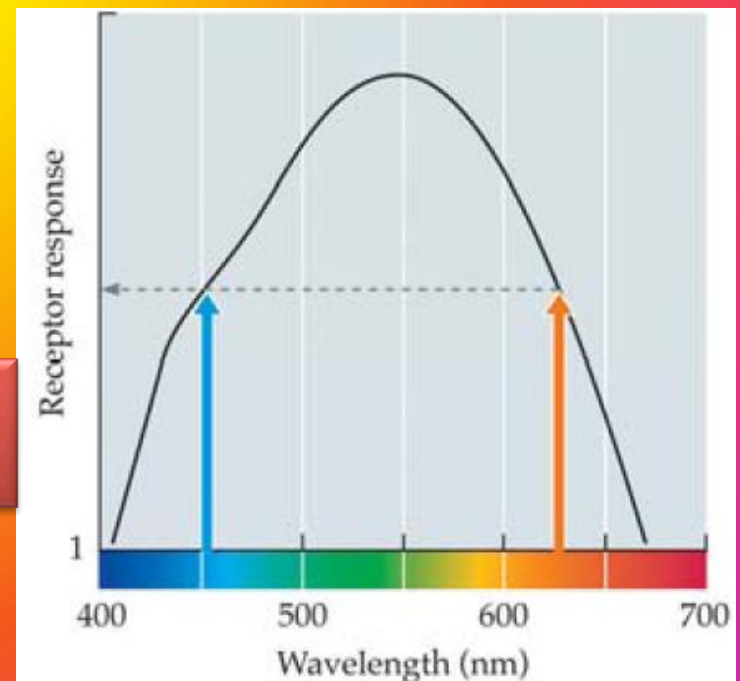
Nei nostri occhi ci sono fotoricettori

BASTONCELLI: visione
notturna in bianco e nero



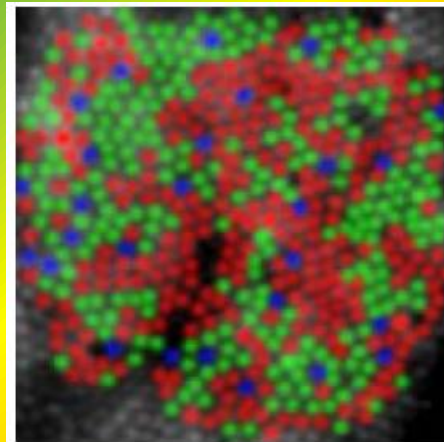
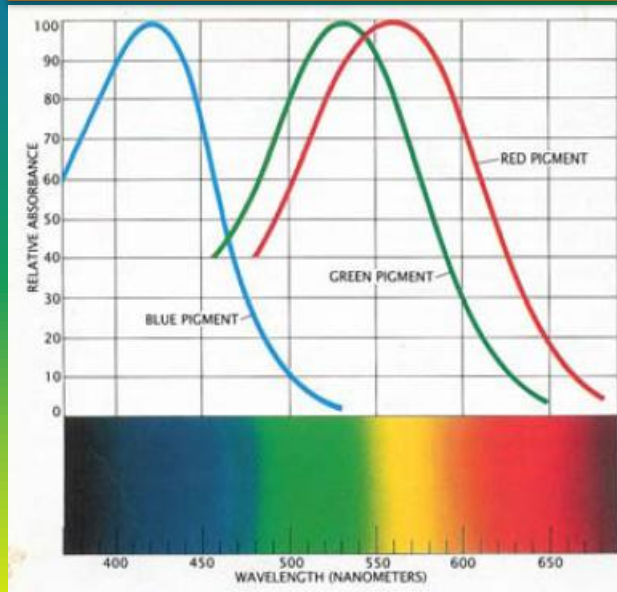
CONI: visione a colori

Con un solo tipo di fotoricettori,
i nostri occhi non distinguerebbero i colori



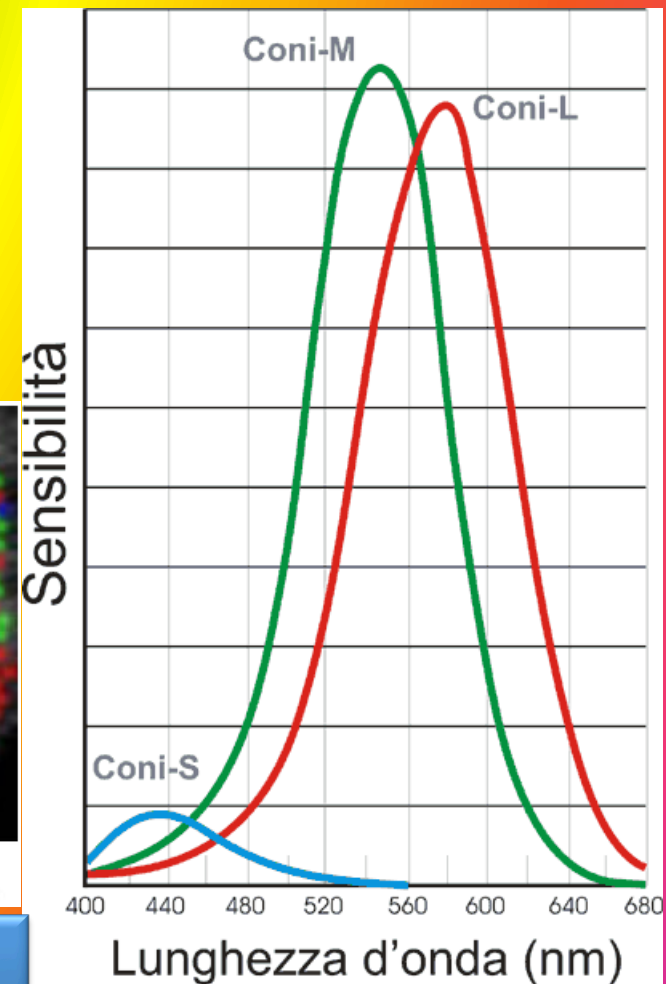
3 tipi di coni: S, M, L

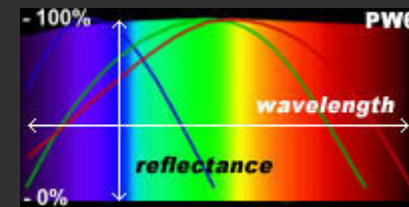
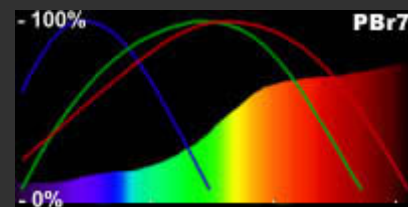
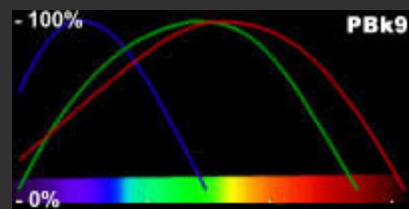
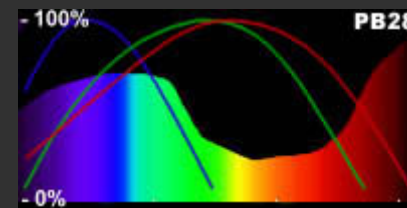
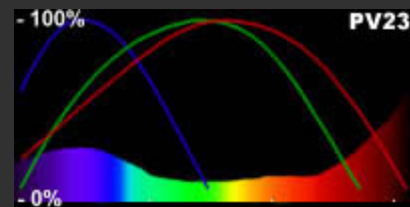
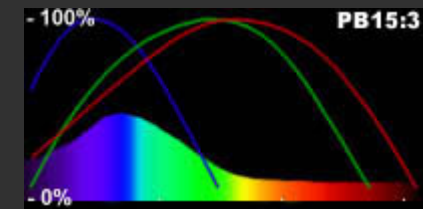
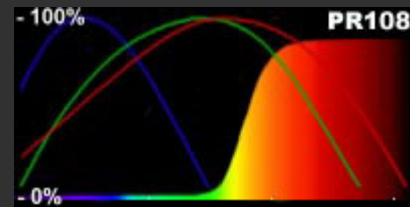
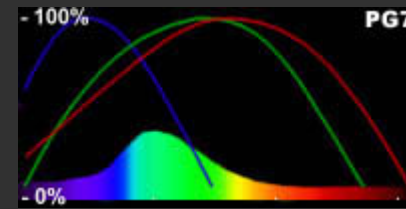
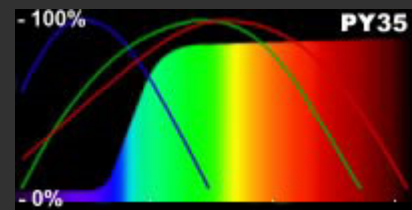
Con 3 tipi di coni riusciamo a distinguere radiazioni luminose di lunghezze d'onda diverse, e quindi a vedere i colori

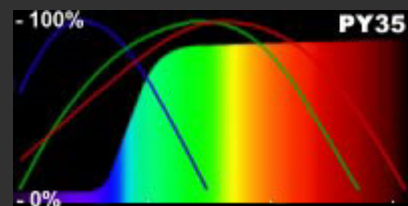


L 50.6% M 44.2% S 5.2%

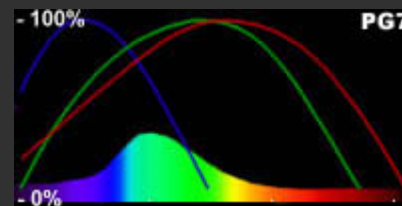
I coni S (blu) sono i meno numerosi, quindi abbiamo meno sensibilità per questo colore



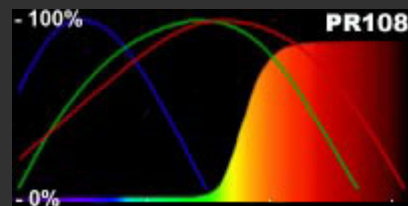




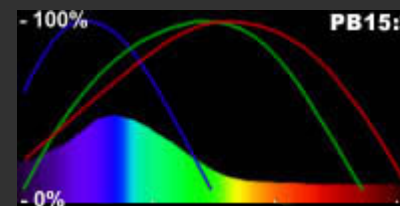
Giallo



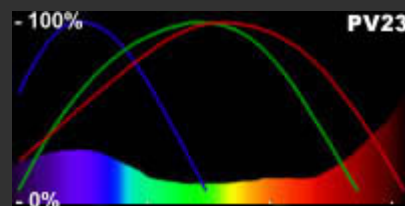
Verde



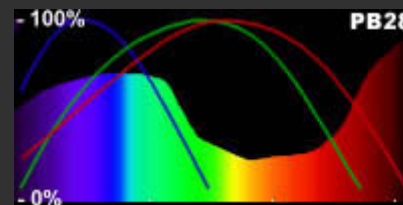
Rosso



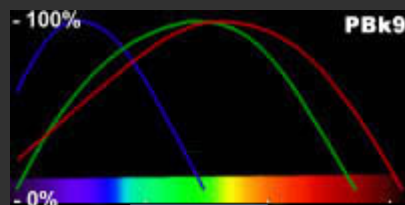
Blu ftalo



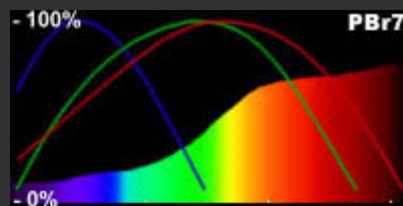
Viola



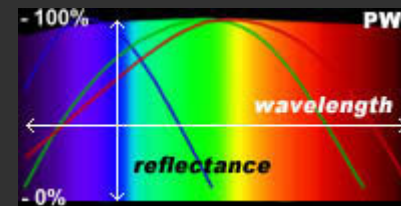
Blu cobalto



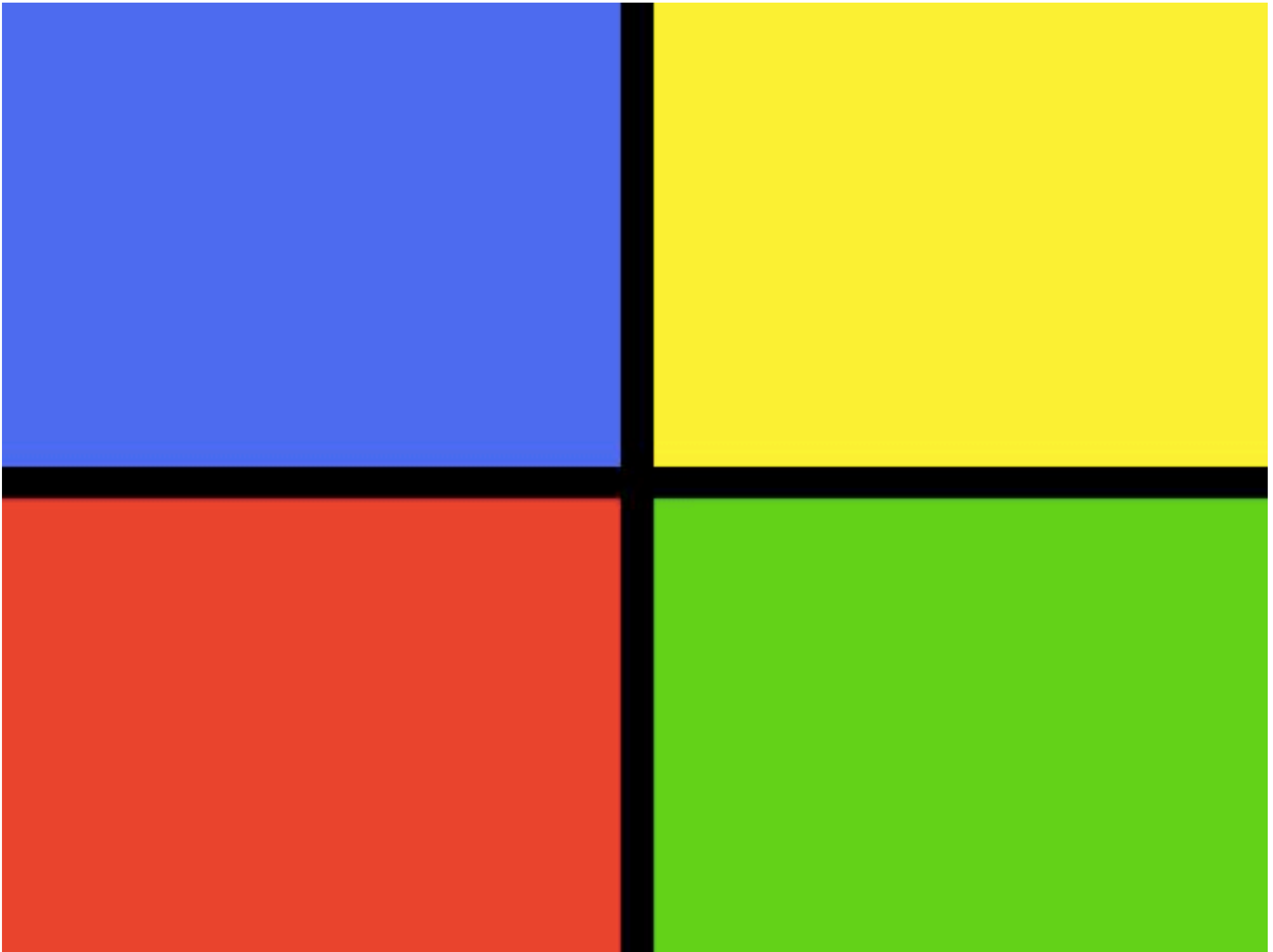
Nero

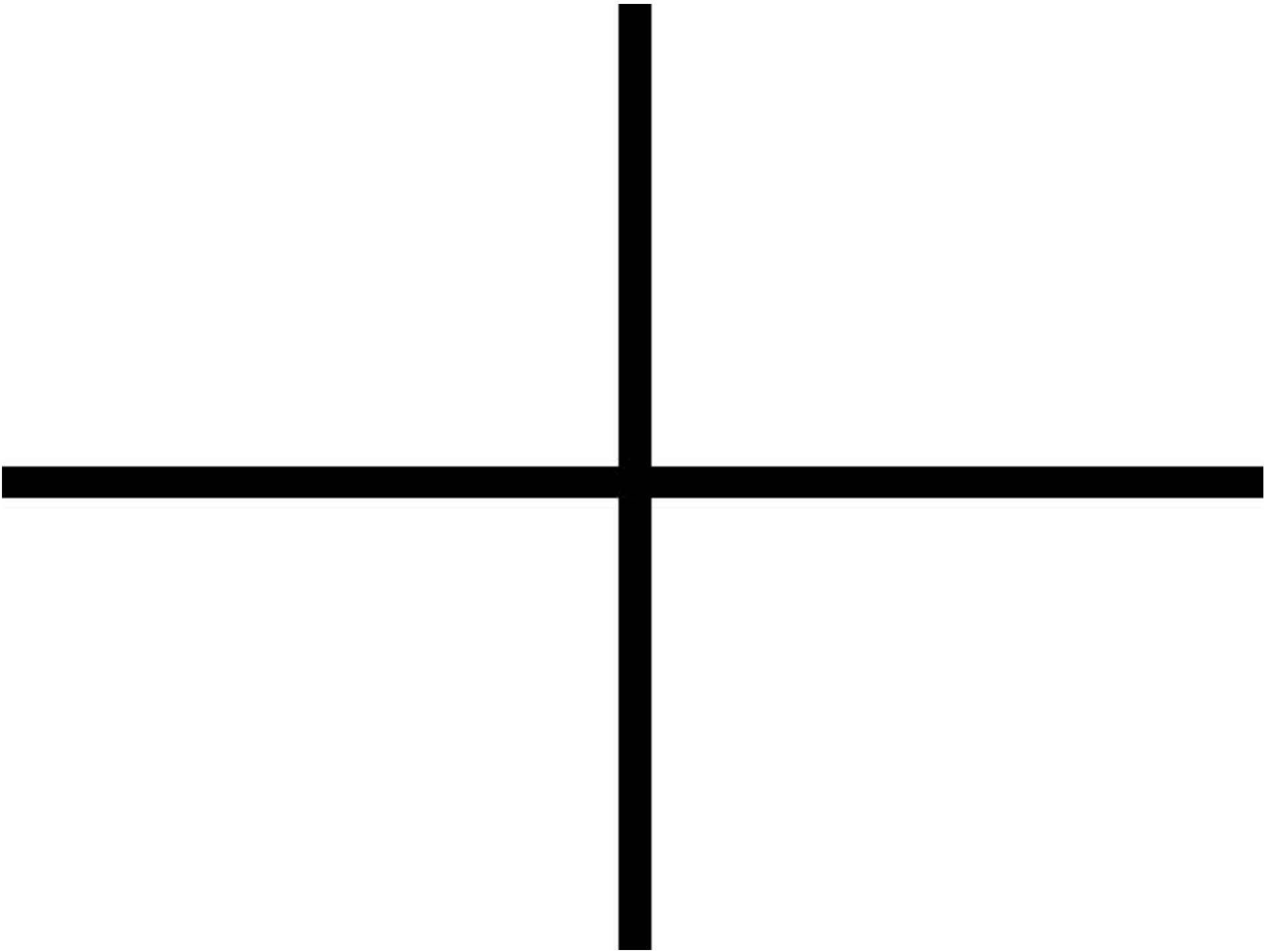


Siena



Bianco



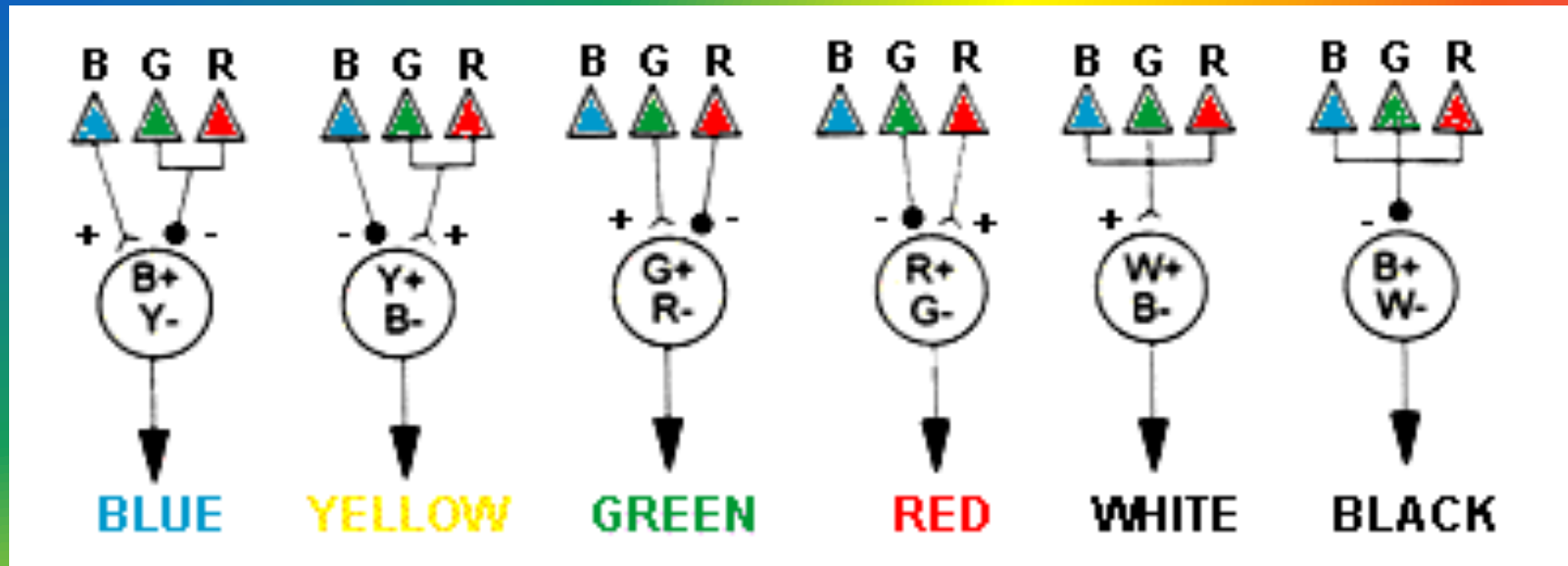


Opponenza dei colori

- Bianco e nero sono “opposti”
- Verde e rosso sono “opposti”
- Giallo e blu sono “opposti”



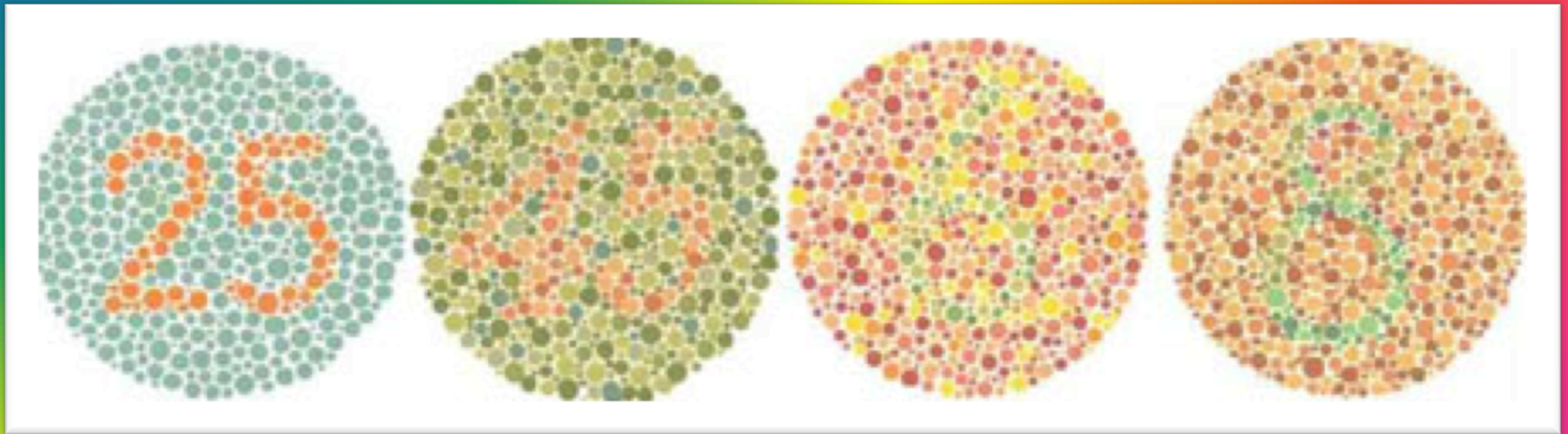
Opponenza: schema elettrico



Il segnale dei fotoricettori non arriva direttamente al cervello, prima viene combinato in “canali” che amplificano sensazioni opposte

Daltonismo – visione dicromatica

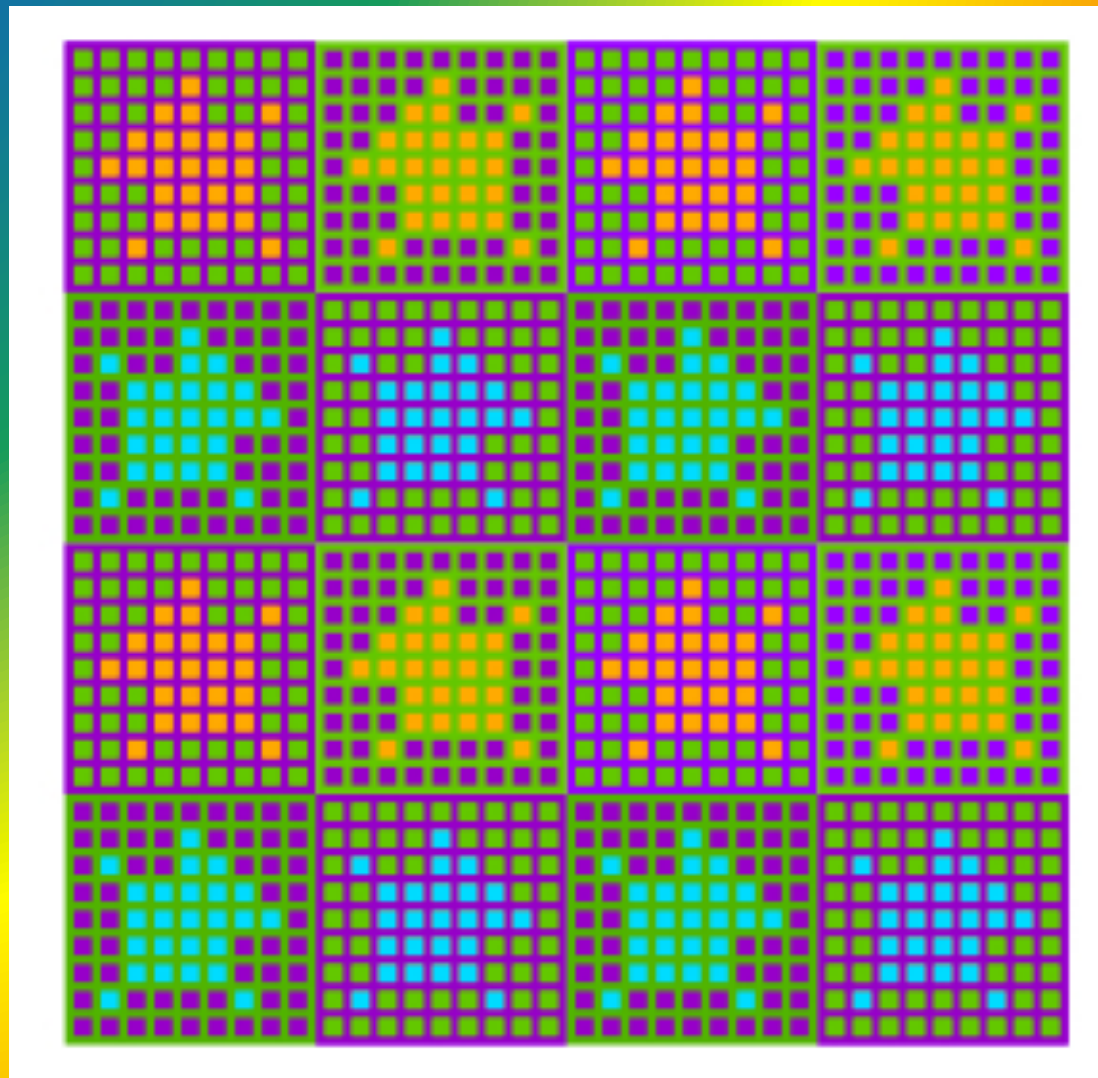
Problema con uno dei tipi di coni, di solito quello verde o rosso (8% della popolazione)



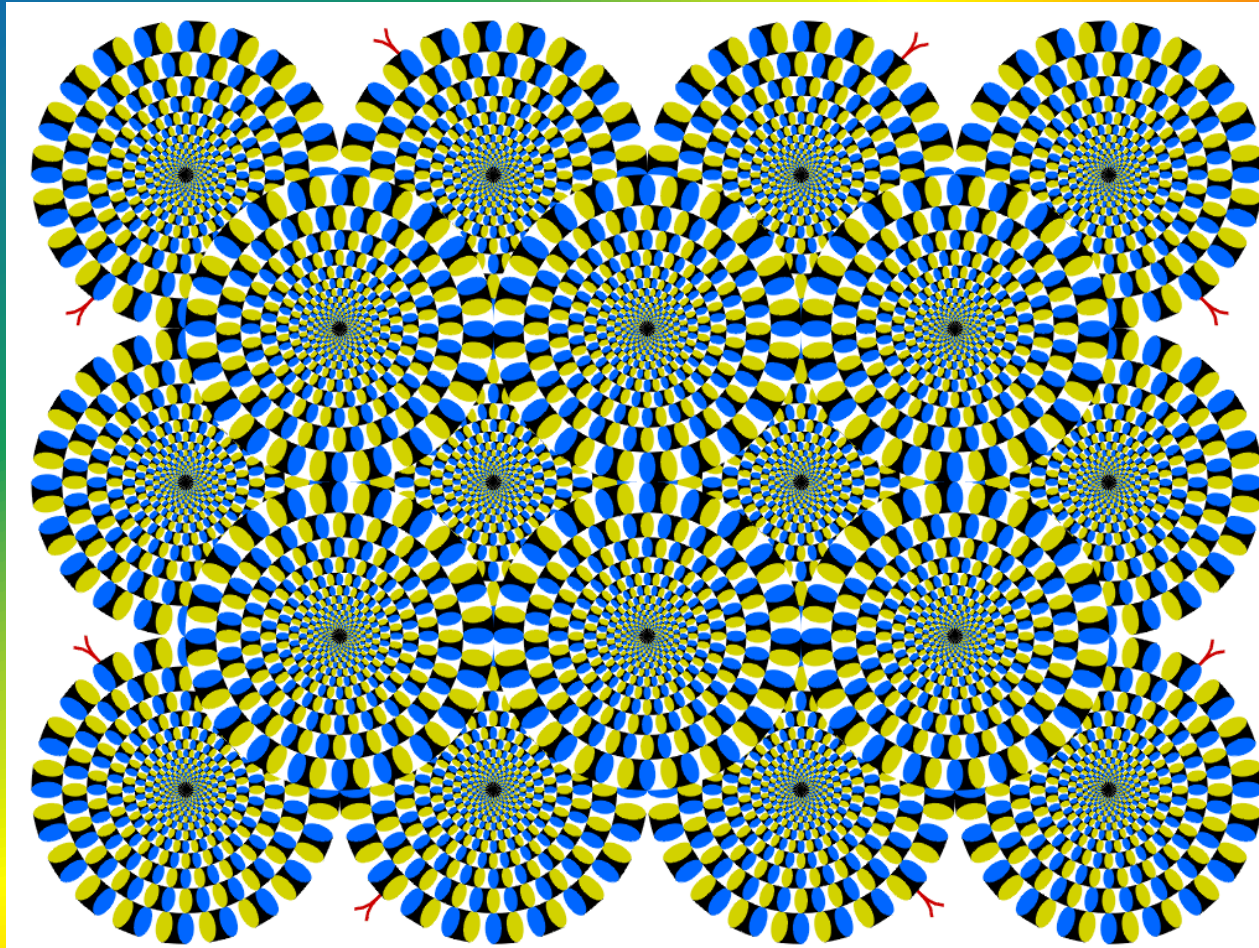
I mammiferi, tranne i primati, hanno una visione dicromatica, cioè hanno 2 tipi di coni soltanto

certi uccelli vedono invece nell'ultravioletto

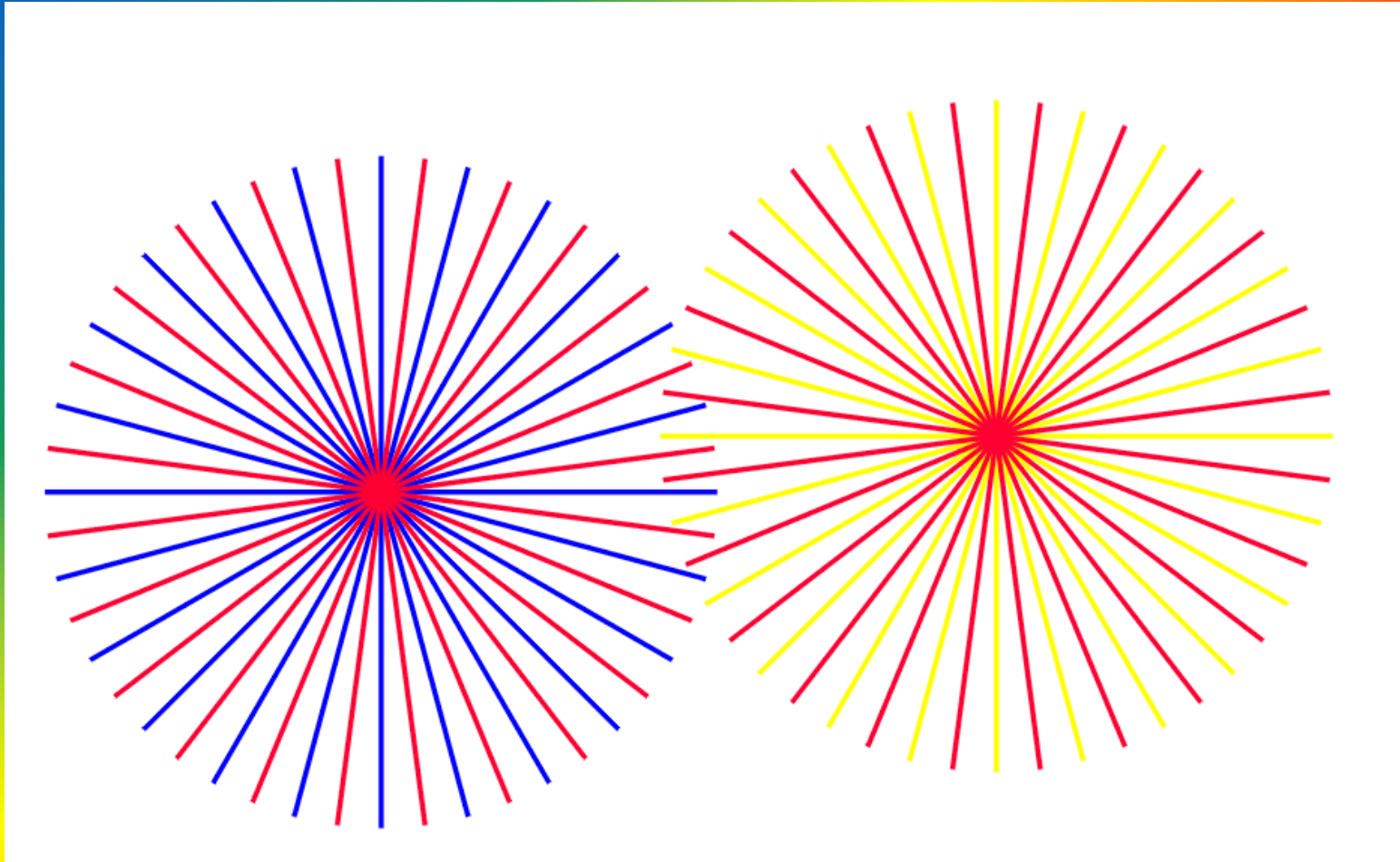
Illusioni ottiche: colore dei cani



Illusioni ottiche: movimento



Illusioni: colori



Conclusioni

- Quello che noi chiamiamo colori e' il risultato di una complessa sequenza, che parte dalla luce di una sorgente; questa viene parzialmente respinta dagli oggetti, e un complesso spettro di frequenze viene recepito dai fotoricettori negli occhi, i cui segnali sono combinati per esaltare colori che consideriamo opposti. Alla fine il cervello elabora questo insieme di segnali.