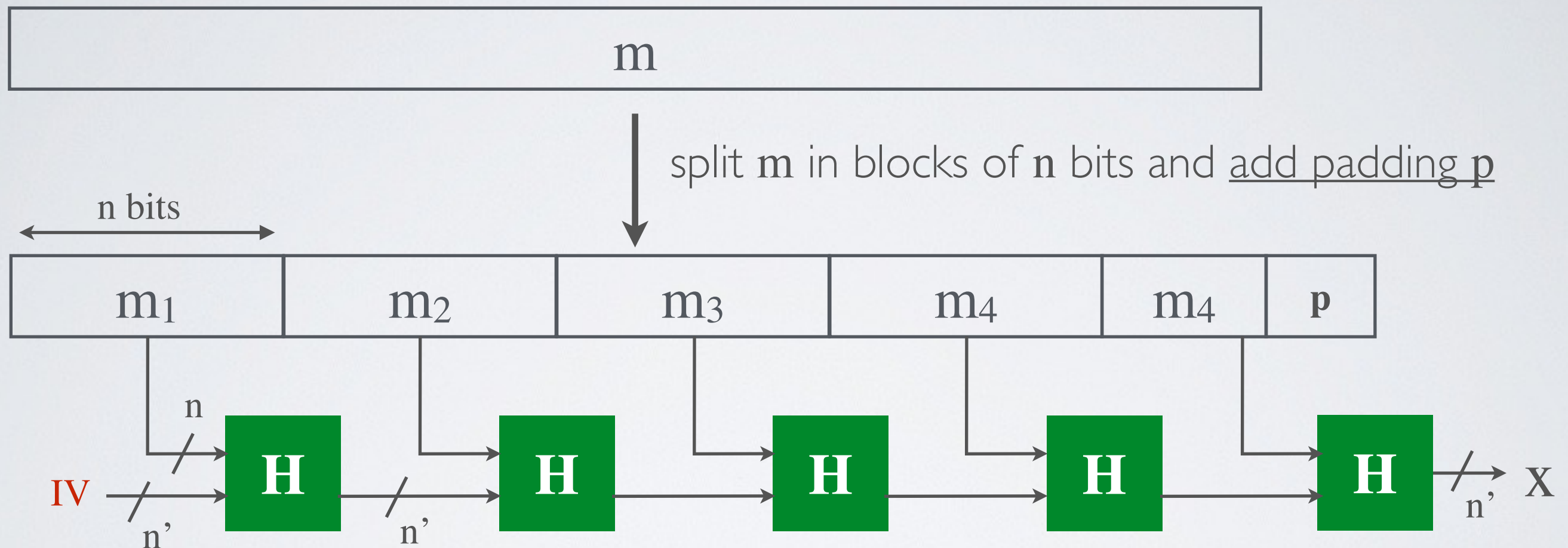


How to hash long messages ?

Merkle–Damgård construction (MD5, SHA-1 and SHA-2)

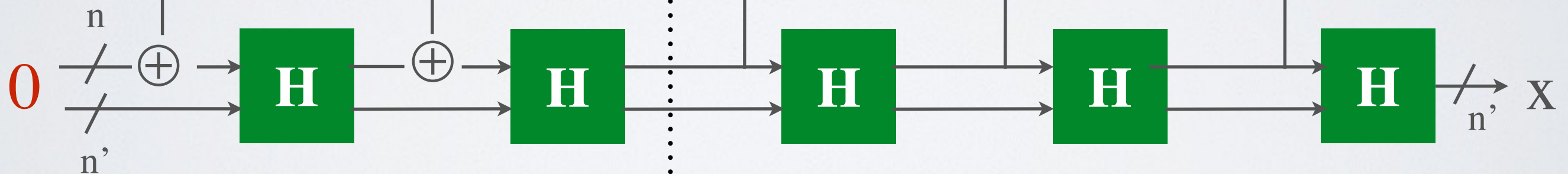
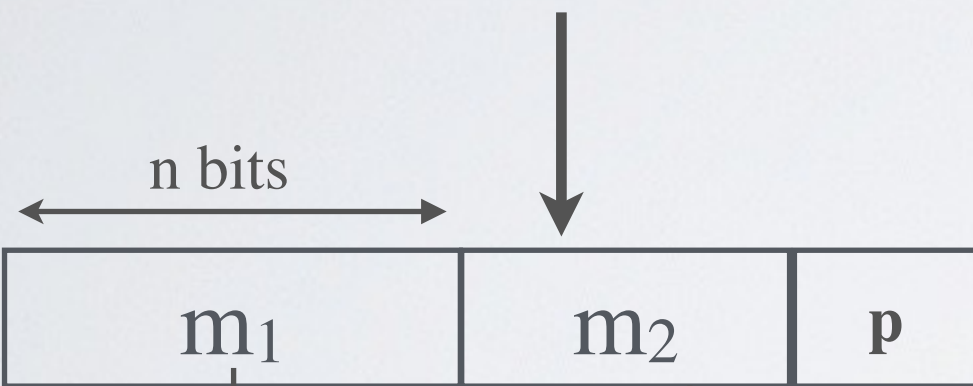


Property : if H is CR then Merkel-Damgard is CR

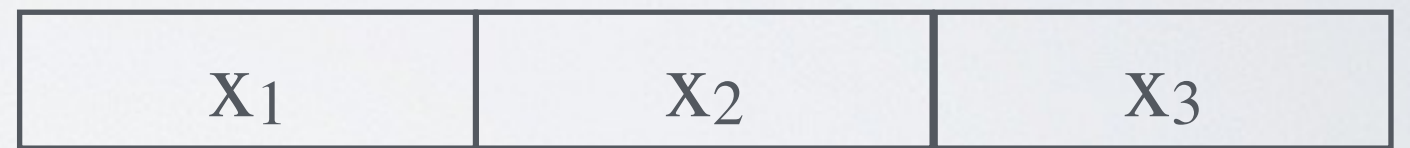
How to hash long messages ?

Sponge construction (SHA-3)

split m in blocks of n bits
and add padding p



assemble the hash



absorbing : *squeezing*

Property : if H is CR then Sponge is CR