Saal: Simulacron-3 | 19:15 | 00:30 | Day: 1 | Track: Hardware & Making | nA

Title: **Freifunk in TV-Whitespace**

Subtitle: More frequency spectrum with better propagation properties for WiFi mesh networking

Speaker: **Elektra**

Short: *WLAN and mesh networking in the UHF band: More frequency spectrum with greater range for better and cheaper broadband access for everyone. The digital dividend through the digitization of terrestrial TV offers an important opportunity for better coverage and more bandwidth for all. Unfortunately, the UHF-TV spectrum is being auctioned off to the big telecommunications companies. As a result, broadband usage remains expensive. The UHF-band mesh network of the "Freifunk" open wireless radio networks community in Berlin is a first step in a different direction.*

Long: Serious media use does not work without WiFi or LAN cable and also free and open wireless community infrastructure like Freifunk would be hardly conceivable without WLAN. 3G and 4G is good in between WiFi and LAN access just for frugal internet use. The 2.4 GHz wireless frequency band is a big mess. Here, the WLAN users are crammed into only four non-overlapping WiFi channels. In order to increase the chaos yet there's also remote-controlled toys, Bluetooth, wireless audio and video transmission systems, surveillance cameras, microwave ovens. Many of theses applications are transmitting uncoordinated. Scoffers refer to the 2.4 GHz band for its modest properties as 'junk band' - and yet it has become an important resource in our infrastructure, if not the most important resource alongside WLAN in the 5 GHz band. The 5 GHz WLAN frequency band offers more space, but because of even more pronounced quasi-optical properties, the range for local broadband coverage is even lower and soon also LTE networks are allowed to use this resource. (And LTE is going to share the spectrum in an unfair manner because of differences in the protocol, but that is a different subject.) There are ways to improve the digital broadband coverage: Due to the switch of terrestrial analog TV to DVB-T, now a major part of the UHF TV frequency spectrum is unused - the digital dividend. This frequency range has substantially better properties than the radio channels at 2.4 GHz and 5 GHz: objects such as trees and shrubs attenuate the signal much less. It is much easier to provide a broad range WLAN coverage in that part of the frequency spectrum. Much of the TV band is soon to be auctioned to the telco industry or has already been auctioned. We always hear from politicians that the public purse has benefited enormously from the revenues from spectrum auctions. This warm rain for the Treasury is going to be financed by us, the Internet users and Telco customers, by the extra expense for broadband usage that we are spending. In effect, such spectrum auctions are a hidden tax for wireless broadband access. But there might be a better way: A dedicated part of the currently unused TV channels could also be dedicated to unlicensed, digital broadband operation with WiFi. Everyone involved would benefit - the mobile operators, because the large telecommunications companies are already using unlicensed Wi-Fi to do "mobile offloading": Your DSL-WiFi router at home might already provide a commercial hotspot for the telecommunications company you are renting the DSL line from, in order to serve broadband to their customers on the street in front of your flat. The resulting cost savings for the large telcos are estimated to be over 80 billion in 2015. The session presents the TV-Whitespace hardware project, which has been developed by Freifunk, its background and goals. (These are the channels 1, 5, 9, 13: The frequency channels between them should not be used it, as they interfere with the adjacent wireless channels and the channel access between different wireless networks can not be coordinated effectively.)