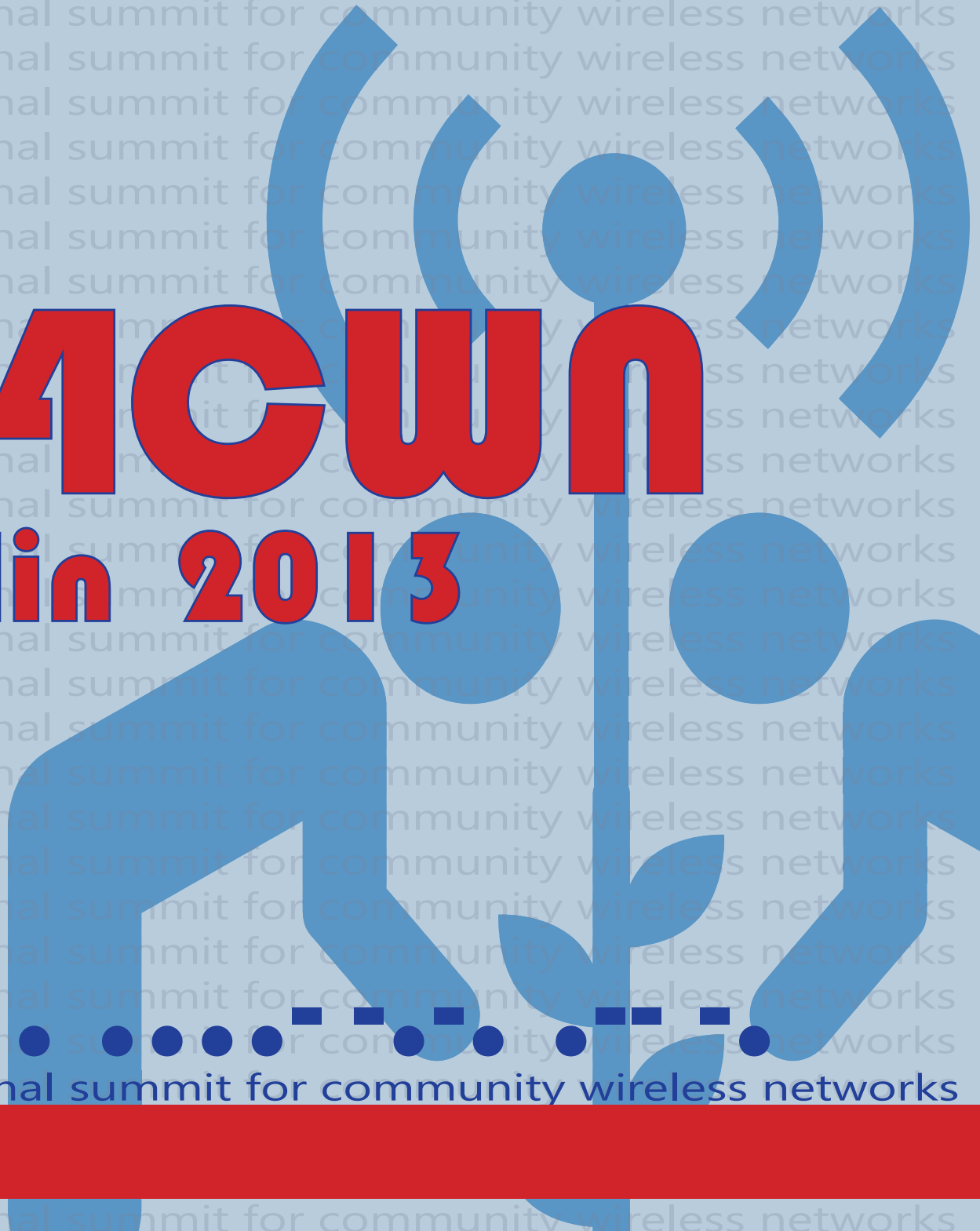# Welcome

Friends of Community Wireless:

Wilkommen!

Welcome to Berlin and the seventh International Summit for Community Wireless Networks! We are thrilled to present an exciting and enriching agenda with speakers, panelists, and participants from every continent. Additionally, this year's Summit honors the achievements of Freifunk, Germany's first community wireless network, as we celebrate their ten-year anniversary.

When we convened the first Summit in 2004, it helped launch what is now called the community broadband movement. Since then, we have gathered in the United States and Europe to continue the conversation and to foster collaboration between technologists, policymakers, and community organizers who are interested in the development of next-generation community networking technologies. The 2013 Summit aims to take things to the next level, bringing a record number of participants not only from the US and the EU but also from all around the world.

We look forward to an exciting, informative, and collaborative three days!

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Summit Network

Commotion

The IS4CWN network is a Commotion Wireless mesh network. Access points are named according to the rooms or areas where they are placed. Depending on where you are located, connect to the nearest access point. When you first open a web browser after connecting, you should see a splash page with two options: Local Applications and Internet. The second option is obvious. Local Applications will display the apps available on for the Summit on the local mesh.

CoMMoTIoN

TidePools
tidepools.co
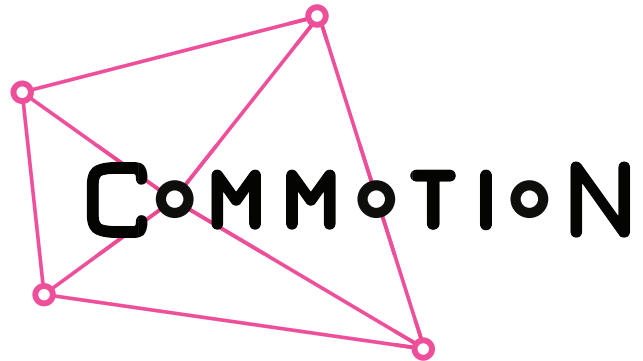
Tidepools

Tidepools is an application providing a map of the Summit locations, both at C-Base, ETI and in the surrounding area. It also provides a filterable schedule of sessions by location. When viewing a particular session you will find links to presentation files and an Etherpad link for collaborative note taking on that session. You also can add your own events, locations, etc., to the map—for instance maybe you know about a great place to eat or drink near the conference area, or want to promote an ad-hoc meetup.

Need help?

Visit the hacklab help desk in c-base to get assistance in person, or email support@wirelesssummit.org.

Code of Conduct

IS4CWN Diversity Statement

Access to technology and technical knowledge has been historically inequitable and remains so to this day. Recognizing this, the International Summit for Community Wireless Networks aspires to include participants and speakers from a broad range of backgrounds and experiences. We seek and welcome diversity in order to reflect the communities that wireless networks can and should serve, cultivating expertise, creativity, and innovation. Please join us in creating an environment of respect, equity, and accessibility at all levels of Summit involvement.

IS4CWN Anti-Harassment Policy

The International Summit for Community Wireless Networks is dedicated to providing a harassment-free experience for everyone. We do not tolerate harassment of conference participants in any form. Summit participants violating these rules may be sanctioned or expelled from the conference at the discretion of the conference organizers.

> Our full anti-harassment policy can be found at:
> http://2013.wirelesssummit.org/content/is4cwn-diversity-statement

Contact a Summit staff member or email help@wirelesssummit.org if you need to report an incident.

These statements are licensed under Creative Commons Zero License: http://creativecommons.org/publicdomain/zero/1.0/

Summit Agenda

IS4CWN 2013 Agenda

We are proud to present the agenda for the 2013 International Summit for Community Wireless Networks. We received a record number of workshop and panel proposals this year, and have been able to put together a dynamic schedule showcasing the technology, policy, and community organizing expertise of our participants. As part of our commitment to diversity, we have endeavored to bring together presenters from a wide range of backgrounds with representation from across the globe.

Most events will take place in one of the three rooms on the first floor. The Main Hall serves as our large plenary space, but will also host panels throughout the day. Two smaller rooms, Session Rooms A & B, will house most other sessions. The Hacklab is located in c-base, just across the courtyard, where a number of tech-centered sessions will be featured. Additionally, the Gallery will host our Documentation Fair and CWN Speed Networking sessions.

Unconference Space

The Gallery and Hacklab will also serve as ad-hoc open forums for participants to share, discuss, and explore the ideas and issues that arise during the conference or that otherwise have no official presence on the agenda. Sign up for a fifteen-minute slot for a more formal presentation of your work, or simply bring your conversation to the room and see what happens....

Questions?

Check Tidepools for the latest agenda updates, or visit the information desk.

9:30 AM

Keynote Address   MAIN HALL

Björn Böhning

"Free Wi-Fi in Berlin: The Case for New, Creative Alliances and Active Infrastructure Policy in the Digital Society"

Sascha Meinrath

"Vision Forecast: The Future of Wireless"

11:00 AM

Women and Community Wireless: Addressing Challenges, Sharing Successes   MAIN HALL

Jesica Giudice, Jenny Ryan, Suchisnata Sahoo, Anne Wizorek

Historically, women have made huge contributions to human technology, yet communication tools do not always benefit gender inclusion and equality. These structural forces play out uniquely in tech realms to weaken efforts to build vibrant community technology like wireless projects. Both the everyday sexism of society that translates into tech spaces and the Internet, as well as the unique facets of discrimination in these realms, result in fewer women being involved in wireless projects. Those that are involved can feel isolated, even sometimes attacked or sidelined. If community wireless networks are to realize their potential for galvanizing grassroots communications and community ownership, we must tackle these issues pro-actively.

Participants on this panel will discuss with each other and the audience concrete approaches to challenge systems of exclusion and marginalization. From the GNOME project's paid internship program for women coders to the #aufschrei Twitter campaign in Germany this year to training rural women as technologists in India to co-founding wireless networks, we can learn from what we are doing. Through our experiences, we hope to create a broader dialogue about gender, power and technology.

Community Organizing and Alternative Business Models   SESSION A

Bart Braem, Russell Senior

This session will focus on organizational and business aspects of community networks. The presenters will share how the Personal Telco Project in Portland, Oregon approached organizational challenges, followed by the results of a survey on how community networks are organized around the globe.
The Personal Telco Project is currently a free-to-the-end-user business model. An ISP has provided a free connection for one of their networks, but will discontinue provision of free Internet in March of 2014. Russell Senior from Personal Telco Project will discuss what steps they have taken to rally support amongst the network's user community, and the response so far.

Following on the discussion of model transition, Bart Braem will describe the results of a survey on community networks which was published in the spring of this year. Bart will demonstrate the variety of infrastructure used and the different management approaches of the networks within those communities. The survey also shows the common challenges of the communities, and Bart will provide pointers to tackle those challenges.

Tech Showcase I: Data Collection and Performance Review   SESSION   B

Paul Fuxjaeger, Abinav Narain, Julius Schulz-Zander, Tobias Steinicke
Berlin Open Wireless Lab Testbed:
Berlin Open Wireless Lab (BOWL) has more than 100 Wi-Fi Access Points that are distributed (~50 APs indoor and outdoor) across the Technical University of Berlin

campus. One of the BOWL project objectives is to make the infrastructure available for execution of innovative experiments by experimenters. Examples of such experiments may include, but are not limited to, testing of new network protocols or algorithms, network management software, performance measurements, service experiments, or network monitoring software. To this end, we want to encourage external people make use of the BOWL infrastructure for execution of innovative experiments. Furthermore, we want to share our experience and lessons learned on running the OpenFlow protocol in a wireless network.

How to Avoid Tragedy of The Commons in Wi-Fi Networks:

The performance of a Wi-Fi link (in meshes and in access point settings) is subject to sometimes uncontrollable interference and channel congestion. But until now it was very hard to troubleshoot and find out what really causes a link to perform poorly without investing heavily in special measurement equipment and time. This has changed now. We present a heavily modified and enhanced version the already existing software tool called "horst" (lightweight IEEE802.11 wireless LAN analyzer similar to tcpdump, Wireshark or Kismet). This can be used to measure relevant impact factors such as: channel load, the symmetry of distribution of radio resources amongst nodes, the spectrum efficiency of the current link and whether there are other ISM interference sources causing the problem. It is compatible with a broad range of Wi-Fi devices that are Linux-based. This tool is the equivalent to the X-ray equipment in medicine, but for mesh network performance. And it's GPL-licensed. Furthermore, we explain a rather recent IEEE802.11 feature called QBSS load beaconing. It puts relevant channel condition information into IEEE802.11 beacons and therefore allows all neighboring nodes to learn and optimize their behavior adaptive to that. This can be used to implement mechanisms/protocols to cooperatively conserve channel airtime--to avoid depletion of the resources shared—in order to avoid the tragedy of the commons.

Performance Evaluation of Wireless Networks:

We are going to deploy (upgraded version) of the software which logs the Physical layer errors/events, mac layer information from routers in around 100 homes (BISmark platform) and try to understand the problems in home WiFi networks. We can do similar analysis and find out the most prevalent pathologies in mesh/community networks and then focus to solve them, improving the utilization of such networks.

Community Wireless Documentation Fair   GALLERY

Preston Rhea

Networks and projects present at IS4CWN will display and celebrate the documentation, outreach fliers and posters, artwork, photographs, and other media they use to share the impact of their projects. Project representatives are encouraged to bring visually interesting and descriptive media. Representatives should also bring the templates and examples of documentation they use for managing their projects, like spec sheets, deployment report templates, knowledge base collections, zines, newsletters, and network data printouts, among others.

Participants are strongly encouraged to celebrate their network in a large format poster or other similar media to display at the fair. The display gallery will be open during the whole Summit. During the Documentation Fair session blocks, representatives from each project will share the design thinking, choice of elements, and best case practices for making media about their networks. At the end of the Fair, people will use stickers to determine the five most popular entries into the display gallery to be recognized before the whole Summit.

1:30 PM

Measuring and Optimizing Network Performance   MAIN HALL

Thomas Hühn, Isaac Wilder

Based on active and passive measurements, there exist a variety of metrics to characterize the performance of networks. Engineers most often refer to the performance of networks by reducing this set of metrics to the link speed expressed respectively throughput in bits per second. Isaac Wilder will discuss a new framework to analyze and understand performance of networks and Thomas Hühn will show how transmit power control in WiFi networks increases overall network performance. In the first part of the talk, Isaac Wilder will present the Delta-Q framework, developed by Neil Davies, Ken Thompson, and Martin Geddes. D-Q starts from the idea that what matters most is the quality of experience from a human perspective. Performance requirements differ per application, and can be expressed in terms of packet loss and packet delay. By looking at loss and delay, rather than at the usual metrics such as speed, latency, and jitter, it is possible to engage in new and more precise reasoning about network behavior. Without measures to effectively control, tune, and optimize network behavior, however, such a framework is worthless. In the second part of the talk, Thomas Hühn will present his work on Minstrel-Blues, a Linux kernel module capable of jointly controlling transmit power and rate in real WiFi networks. By using his algorithm, spatial reuse is increased, and therefore the overall network throughput, by dynamically adapting the power level per link in such a way, that throughput per link is maximized while interference and spectrum pollution is minimized. This presents new findings in network performance optimization, and will hopefully provide attendees with food for thought on how they can make the most of their infrastructure.

Clommunity: A Cloud Solution for Community Networks   SESSION A

Ermanno Pietrosemoli, Felix Freitag, Leandro Navarro, Marco Zennaro, Roger Baig, Andrés Felipe Astudillo

Community networking is an emerging model of a shared communication infrastructure in which communities of citizens build and own open networks. Community networks have proved successful in providing IP-based networking to the user. The number of applications and services which are deployed within community networks, however, is surprisingly low, missing the opportunity of having an important additional value for society. Cloud computing infrastructures, common in today's Internet, hardly exist in community networks. In this session, we will analyze the characteristics of community networks in order to derive scenarios for community clouds. We will then explain our approach to bring clouds into the Guifi community network. As a first step, we have started integrating part of our cloud prototype into the Guifi community network management tools. We will discuss with the audience how our approach for community clouds is applicable and extensible to other community networks.

Networks in Conversation: Cameroon, India, South Sudan, and the US   SESSION B

Hemant Babu, Al Banda, Stephen Kovats, Matthew Rantanen

This panel brings together representatives from networks in Cameroon, India, South Sudan, and the United States.

LANd of Red Clay: Community Wireless Networks in Cameroon

This discussion will explore community wireless networks as access points to local content for Cameroonians, who currently face poor quality for expensive Internet access and discuss how activists cut access prices by about 90% for their target markets in Cameroon, despite enduring problems like poor competition and political corruption.

#OSJUBA Wireless, South Sudan

Using the power of free and open technologies the #OSJUBA - Open Sourcing South Sudan Initiative proposes to apply the methodologies of the international Open Source / FLOSS, free culture, and hacktivist communities in helping to create a vision for the new state. One of the key challenges of this initiative is the development of a self-reliant Open Server Backbone (#OSBACK), as part of a comprehensive South Sudan Open Systems Strategy. Based on open source and wireless technologies and methodologies, #OSBACK employs renewable and self-sustaining energy sources.

Tamarind Tree/Nomad Project, India

Located in the western Indian tribal belt, at a small hamlet of Sogve, Tamarind Tree school caters to the children of Warli, an indigenous forest-dwelling community that continues to be on the fringes of development. The school, in collaboration with Nomad, has seeded a wireless network comprising parents of the school children in order to create an organic network that would be created and owned by the community rather than merely deployed for them by philanthropy. Nomad has been experimenting with consumer grade routers to ensure organic proliferation of the network. In addition, Nomad is also developing home brewed antenna to make it a community project in its true sense.

Tribal Digital Village, USA

The Southern California Tribal Chairmen's Association (SCTCA) is addressing the lack of Internet access for its tribal communities, taking their wireless broadband network to the next level of support for its communities, the "tribal home". The Tribal Digital Village program supports key community operations on reservations and has created over 350 miles of point-to-point and point-to-multi-point links supporting 86 tribal buildings and anchor institutions. Its goal is to bring speeds of 5Mbps to the 2,700 homes on the 17 tribal reservations--some 8,900 people--because there are no terrestrial broadband services available to fifteen of those reservations, while two have access only to cost-prohibitive services that do not deliver appropriate speeds.

Pico Satellites   HACKLAB

Julian Priest

Pico-satellites and nano-satellites are new low-cost, fully functional satellites that are now becoming available to a wider audience for orbital applications. The workshop, led by Julian Priest, who is using a Kicksat sprite as the basis for a forthcoming artwork 'The Weight of Information,' will be an introduction to pico-satellite development based on the Kicksat project. Zachary Manchester's Kicksat project is launching a cloud of ~200 pico-satellites into low earth orbit on December 9th where they will stay for three weeks before burning up on re-entry. The pico-satellites called sprites are 2 cubic centimeters, weighs ~5gm and includes a solar panel, an MSP430 processor, solar panel, gyro and magnetometer, and are able to transmit radio messages back to ground stations on Earth. The workshop will consist of an introduction to the Kicksat sprite, and will give participants the chance to create an Internet-connected ground station for listening into transmissions from the cloud of Kicksat sprites during their orbit. The workshop concludes with a discussion of the possible uses of pico-satellite and nano-satellite technologies.

3:00 PM

Solutions to Break Iran's Digital Blockade

MAIN HALL

Hamed Behravan, Trevor Ellerman, Danielle Kehl

Post Iranian election, and after the US government has lifted some of the sanctions on ICT equipment and software, the internet freedom community has a lot of work to do. Are existing solutions sufficient to bypass Iran's Filternet? What new solutions are emerging and how can solutions be designed to reach a critical mass? What are the gaps in deploying new tools to end users? This session will discuss how community wireless networks can be used in the Iranian context and ways in which these networks can help spread connectivity and help citizens avoid government censorship and surveillance. Panelists will discuss experiences operating inside Iran and other hostile environments around the world where the free flow of information is heavily repressed, as well as what the lifting of some US sanctions means for community wireless networks.

Learning How to Teach (How to Build a Network)

SESSION A

Andy Gunn, Diana Nucera, Theresa Landrum, Shahid Ahmad

Several groups offer trainings on building networks, utilizing different techniques and pedagogies. We want to examine what has worked and what can be improved from multiple perspectives—especially from the perspective of those that have been through these trainings. We invite the participants from community and broadband network planning and construction workshops to share their experiences and discuss the process with the trainers directly.

A discussion around pedagogy will be followed by a fishbowl between trainers and trainees from programs organized by the Open Technology Institute, Allied Media Projects, Digital Empowerment Foundation, and others. All workshop attendees are invited to rotate into the fishbowl to participate in the discussion and break down the "trainer knows all" mentality.

Adoption and Adaptation of Community-Based Technology for Social Justice

SESSION B

Tan Vu, Nasha Taylor, Brigitte Daniel, Ellen Foster

Explore opportunities to weave technology through grassroots humanitarian spaces advocating for social justice and community empowerment. Panelists from Troy, New York, and Philadelphia, Pennsylvania, will discuss the power of hyper-local collaboration and program innovation to develop community-based technology learning and access centers for youth, adults, and families that lead to wireless access adoption. These spaces serve as neighborhood hubs for the creation, exploration, adaptation, and manipulation of digital media and technology. Separately, the work in these two cities espouses the potential to stabilize and strengthen communities with confident, connected families by building a network of resource partnerships for wireless access. Together, their experiences contribute to the growing momentum of the global movement for digital literacies serving to increase the rate of adopters who not only critically consume media and broadband technology, but can also create it.

Empowering Local Networks to Collect Local Data

HACKLAB

Matt Hampel, Prashant Singh, Alicia Rouault

Community networks empower citizens to understand and use data and technology for the public good, but face challenges including connectivity, cost, accessibility and device fragmentation. This panel will bring together experts in emergent civic technology to discuss strategies for engaging residents to overcome these barriers and reinforce the value of community wireless efforts. Case studies from US cities like Detroit, Michigan, will highlight the value mobile tools provide for community members to create and own data. The panel will also discuss policies and other opportunities for more open networks to work in this space, both locally and globally.

CWN Speed Networking

GALLERY

Ryan Gerety, Preston Rhea, Andrew Bolden

Come and meet other Summit attendees in a fast, fun session of one-on-one conversations! These sessions facilitate quick introductions between people attending

the Summit. Veteran community wireless organizers and technologists from established community wireless networks are invited to offer their ideas, strategies, and encouragement to participants who are new to community wireless. First-time Summit attendees can learn from others and find opportunities for collaboration.

In this session, you will have the opportunity to meet many people, share your experiences and challenges, and make connections that will enrich your Summit experience. Two identical sessions are offered, one on Wednesday and one on Thursday, to permit as many attendees to join as possible. It is not necessary to attend both sessions.

4:30 PM

Plenary Session: Ten Years of Freifunk History in a Nutshell   MAIN HALL

Bastian Bittorf, Thomas Hühn, Ulf Kypke, Sven Ola

As all of our speakers started in 2003 to get their hands on building Freifunk adhoc WiFi networks, we would like to present different community perspectives from 10 years of Freifunk. We will show several pictures, impressions, topologies, and social aspects of Freifunk mesh networks in the city of Berlin, the city of Weimar and the village of Sundhausen, from their birth in 2003 until today.

Thursday   3 October 2013   Donnerstag

10:00 AM

Keynote Address   MAIN HALL

Mahabir Pun
"Challenges and Opportunities to Build and Run Community Wireless Networks in the Rural Areas of Developing Countries—Case Study of Nepal Wireless Networking Project"

Joana Varon Ferraz
"Wireless is Not Enough: Critical Perspectives on ICT4D"

11:30 AM

Coalition-Building for Community Wireless Networks   MAIN HALL

Jenny Ryan

How do free network projects create and cultivate collaborative working relationships with a diversity of community organizations? How do we find a balancing point between existing institutional structures and emerging grassroots endeavors? How do we create stronger relationships with each other for sharing our experiences, ideas, knowledge, and code? The first half of this workshop will consist of a resource-sharing circle for briefly introducing ourselves, expressing our needs, and offering our knowledge, skills, contacts, and other resources for each other. Together we'll create a community asset map that reflects the larger ecosystem of free networks, knitting together a tapestry of the projects, people, and places where networks are beginning, burgeoning, and blooming. The second half of the workshop will be a brainstorm/mind-mapping session, in which we collectively identify community stakeholders and personas. From there, we'll share our experiences with building bridges to other groups, teaching and learning from existing communities, and working through the intricacies of municipal internet policy, ISP regulations, and funding opportunities. We will conclude the hour with a breakout session of small groups if desired. Post-workshop reflection will take place on an etherpad and extend into hopefully long-term collaboration. The end goal is to learn and hone a technique for identifying community needs and solving problems through the structure of an egalitarian gift-giving circle, in which the primary intention is mutual aid.

Red Hook WiFi: Job Training and Youth Development SESSION A

Anthony Schloss, Katherine Ortiz, Tiwan Burrus, Nijel Taylor-Johnson

The Red Hook Initiative is a youth development center in Red Hook, Brooklyn, home of the Red Hook Houses, the second largest housing development in New York City. RHI's unique model of community hiring has been able to create lasting change both economically and socially for the residents of the neighborhood. In the fall of 2012, RHI began investigating creating a community wireless network. The nascent network played an important role during the recovery of Hurricane Sandy, providing residents and first responders necessary communications access. Continuing the tradition of local hiring, RHI began a program known as the Digital Stewards, employing local young adults to install, maintain and promote the free public WiFi network in our neighborhood. These young residents received technical training in network installation and design, learned digital media production techniques to document their work, and engaged in outreach to the community.

In our presentation, we will present our community network and how we have built it through partnerships with local businesses, non-profit organizations, residents and a local ISP. The Digital Stewards will present the technical information and skills they have gained as well as how the program has helped them develop their job skills and career goals. Finally, we will engage in a discussion with the audience to uncover best practices in creating community designed and governed wireless networks.

Tech Showcase II: Solar-powered Routers and Software-defined Radios SESSION B

Daniel Iland, Xavier Leonard, Ben West

Sunflower Mesh and the COMMUNALcator: Robust Social Meshing from Rooftop to Rooftop:

The Sunflower nodes leverage heavily off the recent development in Commotion and Tidepools, along with minimalist outdoor mounting techniques developed by WasabiNet, to provide a lightweight, low-cost social meshing and mapping platform that is sufficiently low-power to run entirely on solar power and batteries, independent of the grid. Because the nodes can be pre-assembled into a self-contained unit, including solar panel and battery, deployment across a wide area is straightforward. Furthermore, the proliferation of tiny, embedded computers like the Raspberry Pi allows the Sunflower mesh to host applications such as Tidepools and the COMMUNICAL-cator suite entirely within the mesh itself, also on solar power, so they remain accessible even when electric service is not.

The COMMUNAL-cator extends this resilient mesh networking platform to give your community complete communications autonomy and situational awareness. It enables your collective to negotiate voice/data communication beyond the interference of government or corporations and to have persistent wireless monitoring of air/water quality, radiation levels and the health status of all members. The COMMUNAL-cator's smart shirt/glove combo serves this information stream while your hands are free to complete other tasks. Your information streams are shared with remote sympathetic collectives via meshable UAVs that carry data from one network to the next.

Software Defined Radios for Cellular and White Space Communication:

In this workshop, participants will:

1. Learn how to assemble and deploy solar-powered wireless nodes, including how to safely connect your batteries, panels, and load. The devices that I will connect to a Solar-charged battery will include TP-Link Wi-Fi routers, Arduinos, a Raspberry Pi, and Ubiquiti Nanostation devices.

2. Learn how to measure your panel's power generation and your device's current draw. This allows you to determine required battery capacity, solar cell size, develop power-saving modes, adjust solar panel positioning, etc.

Location versus Locality: Building Applications for Neighborhood Mesh Networks HACKLAB

Panayotis Antoniadis, Georgia Bullen, Dan Staples, Seamus Tuohy

What are local applications, and how can they be used? Community wireless networks are often seen as a means for spreading internet connectivity, but they have the potential to offer much more. In this presentation and group brainstorming session, we will examine what distinguishes local applications from internet-based applications that we are used to. Mesh networks in particular exhibit decentralized characteristics that we can harness when building local applications in order to make them more convenient, resilient, and secure. Participants will brainstorm local applications that can meet their community's needs, and end with a demonstration of how to use the Commotion application portal. This will be a presentation for technical and non-technical audiences who are interested in creating and hosting local applications for their community wireless networks.

CWN Speed Networking

<div align="right">GALLERY</div>

Ryan Gerety, Preston Rhea, Andrew Bolden

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2:00 PM

Beyond Connectivity: How Do We Ensure Transfer of Knowledge in Low-resource Communities?

<div align="right">MAIN HALL</div>

Trevor Knoblich, Peter Bloom

Despite the wide availability of data in the world, there is a significant gap in local access to this knowledge, as noted recently by Hans Rosling, professor of global health at Sweden's Karolinska Institute. In this workshop, experts in media development and mobile technology will discuss how information is shared in low-bandwidth environments. Specifically, we will be asking participants to consider the challenges of connecting people without hardware or Internet access to community wireless networks, broadening the reach of news and information. The workshop will include three case studies, followed by active group discussion on the challenges of gathering and sharing information in rural settings around the world. The session will conclude with an interactive workshop, inviting participants to brainstorm with our mobile technology experts on ideas for connecting last-mile communities to those with Internet access via community wireless networks.

Governing the Wireless Commons: Protocols and People

<div align="right">SESSION A</div>

Greg Bloom

When building a community wireless network, the challenges posed by people and politics may be as great, if not greater, than the challenges posed by technology and infrastructure. Within the world of CWNs, what are some different patterns of social and political organization? How does culture, legal regulation, geography, etc., shape the decision-making processes in these communities? What are the organizational aspects of successful networks? What lessons can we learn from failed networks? This session will consider the practices of wireless network-building from the empirical perspective of commons governance (as developed by Nobel Laureate Elinor Ostrom, among others).

Tech Showcase III: Long Links and Wireless Optical Communication

<div align="right">SESSION B</div>

Jeremy Lakeman, Luka Mustafa, Brough Turner

Breaking The Wi-Fi Barrier: Using ISM-Band UHF Packet-Radio Extending the Range of Smart-Phone Based Meshes:

Mobile mesh telephony typically depends on either Wi-Fi or Bluetooth as the transport, because those are the media that are most readily accessible on modern smart-phones. However, both are troubled by short ranges of tens to a few hundred metres, and poor interoperability and mutual compatibility issues, especially when ad-hoc modes are used. Also, ad-hoc Wi-Fi typically requires root access on a handset, which further reduces the utility of Wi-Fi as a solution for this. In this talk, we present the Serval Mesh Extender device, which combines a battery-powered Wi-Fi access point and UHF packet-radio into a compact portable device that offers communications over ranges of hundreds to tens of thousands of metres. This offers the potential to significantly disrupt the existing hegemony on mobile digital communications through the facilitation of low-cost, fully-distributed and resilient mobile telecommunications systems. Experience with prototype units will be discussed, as well as trials with NZ Red Cross as well as any further progress we make between the time of writing and IS4CWN 2013.

Unlocking the Capacity Potential of Community Networks with a Low-Cost Free-Space Optical System Koruza:

We will present the first low-cost open-source high capacity wireless optical communication system KORUZA (http://koruza.net) and discussing its implementation in community and consumer networks. Building on the introduction of this system at IS4CWN 2012, key issues in developing a low-cost communication system along with the use of 3D printing technology will be presented, discussing tradeoffs on the technical and deployment level. Experimental results of a prototype

capable of bridging a line-of-sight 100m building-to-building gap at a gigabit will be used to consider its implementation in various types of CWNs along with the plans for crowd-funding future of the project.

High Capacity Urban Wireless Mesh Networks Using Tight Beams and Automatic Beam Steering

We're reporting early work on a new wireless mesh node design that will enable very high capacity urban mesh networks – networks that anyone can join, no expertise required. To avoid interference in dense urban areas you need highly directional antennas, but that means large antennas. To avoid landlord problems and weather, you'd like indoor mounting, but then the best signal path to the surrounding neighborhood is through a window. And to avoid professional installation, you like automatic aiming. Our answer is a transparent wireless mesh network node that anyone can hang in a window and it "just works." The key is a large, transparent multi-element antenna with electronic beam steering circuitry that automatically finds other nodes and establishes high capacity pointto-point wireless links, window to window throughout an urban neighborhood. Obviously there are materials issues and packaging problems to overcome. We'll explain our proposed solutions, successful computer simulations and prototyping efforts.

3:30 PM

How User Support Can Community Wireless Network Adoption   MAIN HALL

Rita Mendez, Tan Vu, Brian Duggan, Jessie Posilikin

Strong communities socialize and engage with the management of critical infrastructure as much as possible. This has traditionally been a challenge for even the most engaged and activist community wireless network builders. A host of issues prevent every-day users from adopting all kinds of technology, not just community wireless networks. New users lack technical experience. Some users simply don't trust new models of communication or the new social relationships required to help them grow. Meanwhile, many technologists would like to support users better, but lack the time or even interpersonal skills.

How can community network technologists build trust between themselves and local users? How can support structures alleviate the burdens of time and intimidating social factors from both users and technologists? What can support technologists learn from methods of providing health care, housing, or legal advice to marginalized communities? How can spaces that provide support also support community wireless network growth? Spurring enthusiastic and sustainable adoption of wireless networks will require much more than addressing network-specific issues, one by one, on a reactive basis. Support must be collaborative, socialized, multidisciplinary, and embedded in larger struggles for social change. This panel will draw from the panelists' experiences in wireless technology, community organizing, activism, and hackerspaces, to propose tech support structures that solve much more than WiFi problems.

Wireless 4 Communities: Linking Rural Communities of India through Unlincensed (Free) Spectrum   SESSION A

Shahid Ahmad, Ritu Srivastava, Mahabir Pun, Hemant Babu

The workshop will bring together stakeholders who are using unlicensed wireless spectrum as rural wireless-based enterprises in order to connect rural regions of their countries, to share their experiences, challenges, and lessons learned. This will help in developing the policy for utilizing the unlicensed (free) spectrum nationally and internationally. The session will also discuss the importance of free spectrum for the public good; explore the scope and opportunities of unlicensed spectrum in India and other developing countries; discuss ethical challenges and issues around unlicensed spectrum.

Advances of BMX6 Mesh Routing Protocol / LibreNet6, a Mesh Tunnel Broker /   SESSION B
Global Dynamic AAAA DNS Resolution

Axel Neumann, Gui Iribarren

This session will consist of three short presentations about recent advances in mesh technologies, reviewing developments, uses and creative combinations of previously available software. BMX6, the successor of BatMan-eXperimental, is a mesh routing protocol for community networks. Having learned from the shortcomings of commonly used protocols such as OLSR, Babel, and Batman, this relatively young protocol incorporates fundamentally new architectural concepts and mechanisms to address the challenges of wireless community networks. After a short introduction, this presentation will briefly outline BMX6 concepts to address related aspects such as scalability, heterogeneity, performance, self-configuration, and even trust and security. Further, performance measurements based on emulation and community experimentation (e.g. during Wireless Battle Mesh) will be summarized and experiences gathered from real community deployments will be discussed.

In Latin America, lacking nearby tunnel brokers, we suffered from high latencies (600ms RTT) between our community networks, given the 'hub-and-spoke' model of classic tunnel brokers. So, using tinc-vpn and a layer3 dynamic routing protocol, we implemented a "mesh" tunnel broker, where IPv6 traffic between tunnel endpoints doesn't necessarily have to pass through the central management node, saving time and bandwidth. Latencies between neighbouring networks dropped to 30ms, just like IPv4 traffic flows. On top of that, thanks to Dnsmasq feature of "ra-names", we also managed to give each dual-stack client (laptops, phones) a global DNS address pointing to the autoconfigured public IPv6, much like the "dyndns" services from the legacy internet, but on IPv6, and with no setup at all needed on the client side. How can "mary-laptop.dyn.example.org" dynamically point to Mary's laptop public IPv6 will be explained in detail.

Video Streaming: A Local Application of a Wireless Community Network   HACKLAB

Huub Schuurmans

Wireless Community Networks not only provide wireless access to the Internet, but may also form a high-speed and low-cost, local network. One interesting application is the use of the network for live HD video streaming during outdoor events, although there are challenges including network stability and bandwidth; questions of reliability; and ease of use to non-experts. Speakers will discuss their use of the "Network Event Kit" (NEK), which provides an indoor WiFi network with a wired backend, with a setup consisting of mobile nodes, wireless interlinks and video cameras. They will also explore the two practical tests that they have run with this equipment and evaluate how it can be further used for robust, high-speed, temporary networks. Other topics include evaluation of the Raspberry Pi with a camera module as a low-cost camera that can work on automated link configuration, as well as future steps like simplifying the setup, automating the link configuration via the embedded node-pc, and augmenting the user experience by including sound, using multiple camera pans with tilt capability, and remote control.

5:00 PM

The Last Decade For Community Wireless?   MAIN HALL

Community Wireless in the Age of Ubiquitous Wifi in the Global North

Genviève Bastien, Jane Butler, Michael Calabrese, Grady Johnson

The recent emergence of massive cable consortia Hot Spot networks across the EU and US presents a unique challenge to community wireless. If our movement is to survive, we need to start asking some tough questions: What makes community networks unique? What advantages do we offer? How can we distinguish ourselves as more than just last-mile infrastructure? In short, can independent community networks co-exist (if not compete) with ubiquitous commercial Wi-Fi, or will we be crowded off the airwaves?

Free Community Networks: A Latin American Perspective   SESSION A

Nicolás Echaniz, Jesica Giudice

The workshop will bring together stakeholders who are using unlicensed wireless spectrum as rural wireless-based enterprises in order to connect rural regions of their countries, to share their experiences, challenges, and lessons learned. This will help in developing the policy for utilizing the unlicensed (free) spectrum nationally and internationally. The session will also discuss the importance of free spectrum for the public good; explore the scope and opportunities of unlicensed spectrum in India and other developing countries; discuss ethical challenges and issues around unlicensed spectrum.

10:00 AM

Keynote Address   MAIN HALL

Amelia Andersdotter

"Bottom-up and Top-down: Crossroads between Brussels and Communities"

Virginia Eubanks

"Community Networks, Popular Technology, Economic Justice: Can We Do All Three?"

11:30 AM

Access: How Developing Countries Fight for Internet Access and How CWNs Can Help   MAIN HALL

Steve Song, Joana Varon, Paul Muchene

Activists from around the world will discuss their experiences in advocating for better internet and other communications services in Latin America and Africa as part of a broad conversation about the challenge of providing affordable access in developing countries. Community wireless networks will be framed as a tool for expanding access as panelists respond to questions from the moderator and audience about how CWNs and other solutions can contribute to affordable access and supportive national and regional policies.

Local Wireless Networks and Disaster Communications   SESSION A

Sai Madhukar Dandekar, Dr. Kanchana Kanchanasut, Dr. Apinun Tunpan, Anthony Schloss, Katherine Ortiz

This panel on critical communications infrastructure includes researchers and implementers from three projects in three countries. Representatives from intERLab's DUMBONET Emergency MANET project in Thailand, Women In Science and Engineering in India, and the Red Hook Initiative's Red Hook Wi-Fi mesh network in Brooklyn, New York, will introduce their experience with wireless networks in disaster situations. The panel will then discuss shared expectations, findings, and lessons learned in the design and implementation of wireless networks for disaster scenario communications, with a focus on adoption of these networks by marginalized communities to make them most effective when disaster strikes.

The panel's varied participants provide a depth of understanding to all facets of disaster communications. The intERLab representatives, Apinun Tunpan and Kanchana Kanchanasut, will share research, design, and implementation of mobile ad hoc networks for use in preemptive disaster response in rural Thailand. Sai Dandekar from WISE India contributes a study of the social and legal protection of critical information infrastructure and how women can participate in sustaining it. Anthony Schloss and Katherine Ortiz from the Red Hook Initiative's Digital Stewards program in Red Hook, Brooklyn are expanding a wireless mesh network that served as critical communications infrastructure in the immediate aftermath of Hurricane Sandy in November 2012. The Digital Stewards program is designed to train local youth to organize their community and maintain the wireless technology that supports the network in Red Hook.

Tech Showcase IV: Mesh Networking Firmware   SESSION B

Gui Iribarren, Josh King

The Commotion Wireless Project: Past, Present, and Future:

This will be a discussion of Commotion Wireless, a project of the Open Technology Institute, which seeks to create a toolkit of existing open-source software and training materials that allows many different kinds of communities to build their own communications infrastructure. An overview will be given of the project, and its progress up to the current day, with lessons learned. It will also look at the technical roadmap and other plans going forward, to give a view of what the project seeks to accomplish in the future and how it can be of collaborative benefit to the community.

Libre-Mesh, Joining Efforts on Firmware Developments:
During the last years there have been many projects that aim at the development of a firmware to make mesh community networks deployment easier by automating most of the process without loosing versatility.
Libre-Mesh is a firmware base born from the merging of three such real-world-tested firmwares:
* qMp from guifi.net (Catalunya)
* AlterMesh from AlterMundi (Argentina)
* eigenNet from eigenLab/Ninux Pisa (Italy)
This inter-continental development team will present the status of the firmware, it's related tools and future goals.

Long Range Wireless Networking With Ubiquiti Hardware   HACKLAB

Trevor Ellerman
This interactive workshop will be guided by the experience of its participants as they build a simple wireless network and discuss related hardware issues specific to Long Range Wireless Networking, including MIMO and radio polarization; the hidden node problem and ways to deal with and solve it; and energy, frequency and distance fresnel zones. Depending on participant interest, the group may also delve into considerations for networks in harsh environments; disguising wireless network hardware; dealing with unstable power; weather-proofing wireless hardware; and shielded network cables and grounding and lightning arresters.

2:00 PM

Origins and Outlook: Ten Years of Community Wireless Networks in Europe and North America   MAIN HALL

Joseph Bonicioli, Aaron Kaplan, Sascha Meinrath, Juergen Neumann, Ramon Roca
It's been more than 10 years since the founding of some of the early community wireless networks like Freifunk and Funkfeuer. It's time to reflect on the progress made by the community wireless network movement in the past decade and to look ahead. Some of our results in the past ten years have been outstanding, while in other areas we did not achieve as much as we had hoped for. For example, we are still a long way from a completely ubiquitous, distributed mesh network. Mesh networks are still small—even the largest community network, guifi.net is dwarfed when compared to commercial cell phone networks or larger ISPs. And it is clear that 3G (and in the future LTE) are still and will likely remain the most prevalent form of access for the vast majority of people when it comes to wireless.
In the near future, incumbents plan to use the ISM bands ("wireless off-loading") and effectively adapt the free airwaves to their own commercial needs. IT security and privacy is becoming a major issue, and the public is slowly waking up to these. But do we as community wireless networks have a solution to these issues which affect us just as well? In other words, with all the challenges in the present, one thing is clear: in the future, we will (have to) change drastically again. Let's try look ahead to the next 10 years while learning from the past.

Scarcity to Abundance: Dynamic Sharing of Underutilized Spectrum Bands   SESSION A

Michael Calabrese, Linda Doyle, Robert Horvitz, Daniel Kitscha, Preston Marshall, Ermanno Pietrosemoli
Until now spectrum bands available for network operators have been one extreme or another: Either exclusively licensed or a very limited amount of unlicensed. Meanwhile, the 2.4 GHz band is becoming congested as carrier-built Wi-Fi networks (e.g. the FON Consortium in Europe, Cable metronets in the U.S.) add millions of access points. Technology and policy are now pointing to a third way with the potential to unlock an abundance of open spectrum for CWNs: Dynamic Spectrum Access (DSA) to a range of underutilized spectrum bands. The U.S. is moving forward with proposals to open government spectrum at 3.5 GHz for small cell DSA.
In this session, technology experts at the leading edge of this policy debate will describe this fast-moving trend. How will DSA and band sharing work? What practical benefit can DSA have for community and muni wireless networking efforts? Is geolocation database management practical for CWNs? Is small cell LTE a promising technology for shared and/or unlicensed bands? Join us for an interactive discussion following opening presentations.

Networks in Conversation: Mexico, Congo, and the US

Peter Bloom, Ryan Closner, Serge Fundi Etelembongo, Ulysses Jones, Monique Tate

This panel brings together representatives from networks in Mexico, Congo, and the United States.
Rhizomatica and Community-based GSM networks, Mexico

Thanks to a number of open source initiatives like OpenBTS and OpenBSC developed in the last few years, it has become technologically possible for an independent group of people or community to provide carrier-grade cellular phone service to thousands of people at relatively low cost. The presentation will discuss the challenges and accomplishments of Rhizomatica, pioneers in the burgeoning field of community cellular, and will address the technological, social, and legal implications of their work in rural and indigenous communities in Mexico.

Downtown WiFi: How Las Vegas Implemented a Community Wireless Network at No Cost, USA

During the economic downturn of the last few years, the City of Las Vegas, Nevada has been forced to drastically reduce the level and number of services it has traditionally provided. In spite of this fact (or perhaps due to this fact), Las Vegas has managed to implement a free community wireless network in the Downtown Area at no cost to themselves. By strategic design and strong private partnerships, they have expanded their level of service without incurring any of the cost.

Low Cost Wireless Technology for Less-Developed Countries, Congo DRC

This presentation will explore how Wireless (Wifi and WiMax), satellite services, and Mikrotik low-cost wireless technology were used for electoral data transmission during Presidential and legislative elections in 2011. They will also describe using wireless and satellites to connect the headquarters of the Independent National Electoral Commission and its 128 branches across the country, as well as their experiences in deploying a WiMax network in the city of Kinshasa for the transmission of related civil status data and the administration of the city.

Lock Together, Be Engaged: MorningSide Mesh Community Wireless, USA

In the MorningSide neighborhood of Detroit, the local community association has been working since 1979 to make the area a better place. Through block clubs and monthly meetings, community members keep residents informed and connected, and promote community involvement to address concerns, meet needs, and solve problems. Adoption and commitment to a wireless mesh project is a direct result of striving to meet this goal. They are working to dramatically influence the technical aptitude of their community by creating a wireless broadband network. Their vision includes creating Internet access and providing digital literacy to help transform the neighborhood and its residents.

OpenWRT on Raspberry Pi

Andrés Felipe Astudillo

This hacklab session will show participants how to deploy and implement their own local community network through low-cost materials and devices, even implementing sustainable energy-driven WiFi community networks. The low cost and development of the project consists of an embedded router with built-in services. This device is called the Raspberry Pi and is an ARM-based PC. Through the modification of some network parameters of the operating system, called "Raspbian", it is possible to configure the device as a router, as well as include services like instant messaging, off-line Wikipedia, even VoIP services. In this hacklab, participants will be able to learn what kind of modifications are necessary to transform the Raspberry Pi into a router, as well as how to run services and include them at the Raspberry Pi. We will end the session by presenting the way to improve the network and the future works.

Community Wireless Documentation Fair

Preston Rhea

Networks and projects present at IS4CWN will display and celebrate the documentation, outreach fliers and posters, artwork, photographs, and other media they use to share the impact of their projects. Project representatives are encouraged to bring visually interesting and descriptive media. Representatives should also bring the templates and examples of documentation they use for managing their projects, like spec sheets, deployment report templates, knowledge base collections, zines, newsletters, and network data printouts, among others.

Participants are strongly encouraged to celebrate their network in a large format poster or other similar media to display at the fair. The display gallery will be open during the whole Summit. During the Documentation Fair session blocks, representatives from each project will share the design thinking, choice of elements, and best case practices for making media about their networks. At the end of the Fair, people will use stickers to determine the five most popular entries into the display gallery to be recognized before the whole Summit.

3:30 PM

Community Networks as Antidotes to Surveillance MAIN HALL

Rita Mendez, Jessie Posilikin, Griffin Boyce, Dan Staples, Nat Meysenburg

As the cryptopacolpyse continues to expand and engulf all bastions of safe and free exchange of ideas, community wireless network implementers are finding that it may take much more than simply creating an alternative internet to escape the NSA's reach. By the time you read this, technologists will understand much more about the capabilities of the US surveillance state to bridge air gaps, crack crypto, exploit end-user devices and embedded network devices alike, and recover keys via hardware backdoors. The first question any discussion will have to address is whether all hope is lost. But even if it's not, the world can't fight the surveillance apparatus by technical means alone. The "community" in "community wireless networks" will have to organize around technology implementation, develop smart resilience tactics to ubiquitous and targeted surveillance, and engage in local and national policy advocacy to reverse the imbalance between security and privacy. The panelists will draw from their experiences in community organizing, building secure community networks in hostile environments, and technical security work to discuss how technical solutions, policy strategies, and grassroots organizing must vertically align to subvert, resist, and dismantle the surveillance apparatus and even the surveillance states.

Green Technologies in the CWN Domain SESSION A

Robert Rattle, Abdelnasser M. Abdelaal, Dillip Pattanaik

Communicating Green identifies several key domains in which wireless communication applications can have a direct, tangible impact on lowering greenhouse gas emissions and power consumption. Using currently available technology and capital, green wireless is possible without the material growth that typically accompanies the deployment of physical infrastructure and expansion of services. This, however, also requires a mindset that transforms certain objectives of technology use, and larger societal objectives that fuel material growth, social inequalities and physical expansion beyond the capacities of ecological realities. It is crucial to understand that the technologies underlying a green communication initiative in nearly all instances are currently available—new capital investment is not required. What is required is the organization of these technologies into various green communications portfolios that can be readily adopted and purposefully productive. This panel will introduce these issues with three short presentations followed by a group discussion to map a new architecture for wireless networks, aiming at improved well-being for current and future generations. The new architecture, dubbed Green Wireless, abandons the classical transceiver base station design and suggest the augmentation of trans receiver base stations which receives only device.

Tech Showcase V: Mapping Showcase SESSION B

André Gaul, Nicolás Echaniz, Jeroen Avonts

André from Freifunk and Nico from Altermundi will present new solutions for decentralized and scalable node databases and visualization. Numerous efforts to converge the several different community network databases and maps stagnated or were unfruitful. André and Nico are on a new track by using CouchDB whose built-in replication nicely fits the needs of decentralized community networks. The HTTP API and the schema-free JSON storage make the database easy to use and easy to extend. We wish to bring together everyone who is interested in pushing forward one global decentralized community network database and its visualization. Jeroen will describe work on a community network mapper. He will describe how this tool discovers the topology from a community network, which data is extracted for the topology discovery, and how it is grouped to produce a topology graph which can be visualized.

5:00 PM

Keynote Address & Closing Plenary MAIN   HALL

Daniel Kitscha
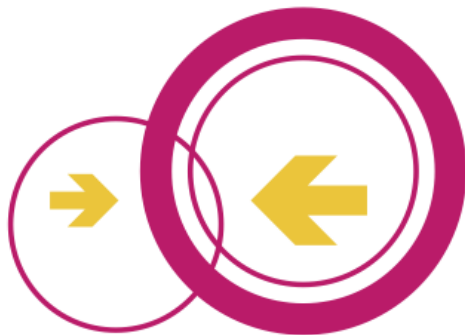"Promoting Wireless Innovation in Europe – The View of the European Commission"

Juergen Neumann
"Summing up a Decade of Community WiFi Networks: Where Do We Grow from Here?"

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Keynote Speakers

Sascha Meinrath

Sascha Meinrath is vice president of the New America Foundation and director of the Open Technology Institute (OTI), where he leads efforts to advance policy and regulatory reforms that protect an open and free Internet, safe communications, and promote competition in mobile and wireline telecommunications. Sascha founded OTI to serve as an innovative tech-tank that promotes public policy solutions while also serving as a center of innovation that develops technological advancements in collaboration with universities and experts around the world. He coordinates the Open Source Wireless Coalition, dedicated to the development of open source, interoperable, low-cost wireless technologies, and is the director of the annual International Summit for Community Wireless Networks (IS4CWN).

An unapologetic advocate for consumers and a counterweight to the major telecom and wireless industry lobbyists in Washington, Meinrath has been a leading voice calling for accountability over the government's leaked program that spies on everyone's phone records and online activities, and is advancing the policy debate over how Congress and the White House should regulate the cybersecurity-industrial complex. His work is a testament to his lifelong commitment to reducing poverty, racial inequality, and injustice, values he embraced while growing up in a rough inner-city school in New Haven, Connecticut. A son of an immigrant from Brazil, Sascha has a three year-old daughter who is both a pre-schooler and budding Internet freedom fighter.

Björn Böhning

Björn Böhning moved to Berlin in 1999 to study at the renowned Otto Suhr Institute of Political Science at the Freie Universität, graduating with a degree in political science in 2004. During his studies he worked at the Social Science Research Center Berlin (WZB) as a student assistant at the Department of Organization and Knowledge. In the years 2005 and 2006 he worked as a staff member of the policy and planning department of the German Trade Union Federation (DGB). He headed the Political Policy and Planning Office at the Berlin Senate Chancellery from 2007-2011. Since December 2011 he has served as Head of the Senate Chancellery of the federal state of Berlin. He is responsible for media and Internet politics and for the governmental aid for the film economy and pop music in Berlin.

Since 1994, Björn Böhning has been a member of the Sozialdemokratische Partei Deutschland (Social Democratic Party – SPD). From 2001-2004 he was the federal deputy chairman and from 2004-2007 federal chairman of the Jusos (Young Social Democrats). Between 2004-2011 he was member of the executive party of the SPD. Today he is an Internet policy spokesperson for the SPD. In that position he takes a stand for contemporary, fair, equitable and widespread political positions on the Internet and its organization. He took part in debates about digital rights and duties, chances and risks caused by the Internet and about new challenges of an interconnected world. He maintains memberships with D 64 Zentrum für Digitalen Fortschritt (Center for Digital Progress), Willy Brandt Center Jerusalem, ver.di Vereinte Dienstleistungsgewerkschaft (United Service Union), AWO – Arbeiterwohlfahrt (Workers' Welfare Association).

Mahabir Pun

Born and raised in Nangi, a remote village in the mountainous Myagdi District of western Nepal, Pun spent his childhood grazing cattle and sheep, and attending a village school without paper, pencils, textbooks or qualified teachers. Traditionally, the local people had no education, but Pun's life changed dramatically when his father, a retired Gurkha soldier, took the remarkable step of moving the family to the southern plain of Nepal and investing their entire savings in his son's education. After finishing high school, Pun worked as a teacher for about 12 years while supporting his brothers' and sisters' education. In 1989, he succeeded in gaining a partial scholarship to the University of Nebraska at Kearney, and graduated in 1996 with a Bachelor's Degree in Science Education. After graduation, he returned to his native village, 24 years after having left there as a child, where he recognized the

critical need for sustainable education and began to formulate his goal of creating a high school to serve as a model for local educational and economic development. Pun founded the Himanchal High School with a special focus on computer education and other programs with income-generating capacity. He then returned to the University of Nebraska for a Master's Degree in Educational Administration, which he completed in 2001.

A community wireless networking pioneer, Mahabir Pun helped to bridge Internet connectivity between rural and urban Nepal in 2002. The Nepal Wireless Networking Project has come a long way since those days of smuggling equipment into the country and operating in a legal gray area: it was not until 2006 that Nepal created unlicensed spectrum. The project now provides rural areas with access to the Internet, e-commerce, telemedicine, community apps, and more.

Joana Varon Ferraz

Joana Varon Ferraz is a researcher and project coordinator at the Center for Technology and Society of Fundação Getulio Vargas (CTS/FGV), Rio de Janeiro, where she works with applied research to public policies related to ICTs. A lawyer, with a bachelor in International Relations with Masters in Law and Development, she has been focused on evaluating the impact of recent debates on Internet policies on both fundamental human rights and innovation strategies and, consequently, on the right to development. As these issues have been requiring wider public awareness, lately she has been searching for new tools to engage users in Internet policies, combining video activism and new technologies that enable participative institutional arrangements for policy debates in the field.

Amelia Andersdotter

Amelia Andersdotter is a Member of the European Parliament. She represents the Swedish Pirate Party and her constituency is the whole of Sweden. Within parliament, she is a member of the committee for industry and research, ITRE, and a substitute in the committees for international trade, INTA, and budget control, CONT. Amelia is currently the youngest Member of the European Parliament.

Growing up outside the small town of Enköping, near Stockholm, she has since studied mathematics, commercial law and Spanish at Lund University. She lives in Brussels where she shares a flat in the near suburb of Molenbeek. Unlike most MEPs she takes the metro to parliament and reads her own e-mail, several hundreds each day.

Internet freedom, a future-minded IT-policy, freer access to knowledge and culture, increased investments in science and research and a more intelligent industrial policy are some of the issues Amelia is the most passionate about. Amelia is a highly sought-after international speaker and expert on topics pertaining to the Internet, intellectual property and IT policy. In 2012, she was named one of the world's top ten Internet activists.

Virginia Eubanks

Virginia Eubanks is the author of *Digital Dead End: Fighting for Social Justice in the Information Age* (MIT Press 2011) and co-editor, with Alethia Jones and Barbara Smith, of *Ain't Gonna Let Nobody Turn Me Around: 40 Years of Movement Organizing with Barbara Smith* (SUNY Press forthcoming). She is also a cofounder of Our Knowledge, Our Power (OKOP), a grassroots anti-poverty and welfare rights organization, and the Popular Technology Workshops, which help community organizations and social movements make the connection between technology and their other social justice goals. She teaches in the Department of Women's Studies at the University at Albany, SUNY. In past lives, she edited the cyberfeminist 'zine *Brillo* and was active in the community technology center movements in the San Francisco Bay area and Troy, NY.

Daniel Kitscha

Dr. Daniel Kitscha works as policy officer in the Spectrum Unit of the European Commission's Directorate-General for Communications Networks, Content and Technology (DG CONNECT). His main tasks concern the development of spectrum harmonisation measures for short-range radio applications including WiFi as well as policies for efficient spectrum use particularly in regard to the shared use of frequency bands.

Prior to joining the European Commission in 2010, Dr. Kitscha was a member of the corporate CIO-Office at Metro AG, where he worked as an advisor on IT-related regulatory affairs and the IT innovation management framework. He holds a M.A. degree in medieval and contemporary history, political science and communication studies from the Johannes Gutenberg University Mainz, Germany and a Ph.D. in political science from University of Siegen, Germany.

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Jürgen Neumann

Jürgen Neumann is a Berlin-based entrepreneur and senior consultant for ICT strategy and implementation at http://www.econauten.de who has worked for major German and international companies and non-profit projects for more than two decades. In 2003 he co-founded http://www.freifunk.net, a non-profit campaign to spread knowledge about open wireless networks. In 2007 he started the Open Hardware Initiative which in 2008 organized the first Open Technology Summit in Taiwan. Recently he is trying to ramp up the Open Source Hardware and Design Aliance http://www.ohanda.org and is lobbying for more open licensing models for the radio spectrum at http://openspectrum.eu. Finally he co-founded http://freigeist.biz where he is exploring the obstacles of open innovation.

Panel Speakers

Abdelnasser M. Abdelaal is Assistant Professor of Information Technology at Ibri College of Applied Sciences, Sultanate of Oman. He earned his PhD in information technology from University of Nebraska at Omaha. His research focuses on quality of service, call admission control, business models, service pricing and socioeconomics of community wireless networks. Abdelaal is one of the founders of the Omaha Wireless Network. He organized mini-tracks and panels on community wireless networks in major International conferences and summits. He has published more than a dozen of papers on community wireless networks in international conferences and journals. In addition, he managed and participated in a number of Information Technology for Development (IT4D) and community empowerment projects. He also provides consultation regarding broadband policy and IT4D.

Shahid Ahmad is presently heading the Wireless for Communities Programme (W4C) at Digital Empowerment Foundation (DEF), a Delhi based not-for-profit organization. W4C aims to provide low-cost wireless connectivity at cluster-based rural regions of the county. The W4C Programme is an effort to provide internet connectivity by using low-cost wireless mesh technology within a 5-10 km radius. The programme aims to use the unlicensed band (spectrum) and use it for wireless networking to reach out to unreached and difficult locations.

Panayotis Antoniadis is a senior researcher at ETH Zurich. His main research contributions to date are in the economic modelling and incentive mechanisms for peer-to-peer systems and in distributed scheduling algorithms for high-speed switches. He is currently pursuing an interdisciplinary research agenda on the role of social software, peer-to-peer systems, and wireless networks for the design of sustainable hybrid neighbourhood communities (project nethood). Panayotis received his Ph.D. degree from the Athens University of Economics and Business in 2006, and until 2012 he was a post-doc researcher at UPMC Sorbonne Universités in Paris.

Andrés Felipe Astudillo is a 21-year-old student of electronic engineering in Colombia. He is the Chair of IEEE-ECCI student branch and active member of the IEEE Computer and Communication Society. He focuses on Open Hardware and Open Software development, has a strong interest in physical signals and wireless networks, volunteers in the Bogota-Mesh community, Ubuntu local community, is a IEEE student branch volunteer, and has spoken many times in different academic and social technological events.

Jeroen Avonts graduated from the University of Antwerp and started as a phd student in the PATS (Performance analysis of telecommunication systems) research group. He worked on various projects related to wireless mesh networks, mainly on channel allocation and topology control algorithms. Currently he collaborates in the CONFINE project, analysing community mesh networks on their structure and dynamics

Hemant Babu is a communication specialist and technologist, and holds a masters degree in Political Science. Having worked as correspondent in the mainstream newspapers in India and international wire agencies for more than 15 years, Hemant broke away to set up an organisation that would demystify communication technology and bring it into the public domain. He currently leads the technical innovation wing of Nomad India Network, which has been insrumental in innovating and developing affordable eqiupment for community radio stations. He has also led Nomad to be the only private sector manufacturer of FM transmitters for community radio in India. Along with his passion for technology, Hemant's committment to bringing knowledge in the public domain is reflected in Nomad's use of open source technology both in its hardware and software.

Roger Baig works with guifi.net, an open, free and neutral network foundation. He participates in the qMp node software and co-organized the 2011 Battlemesh.

Al Banda is a serial entrepreneur with a passion for technology, society and art. A quintessential, multilingual, third-culture kid (having grown up across America, Europe & Africa), he lives to bridge gaps between analogue and digital communities and leverage creativity for sustainable development. Al manages ActivSpaces, Cameroon's leading innovation hub, and plays around with mixed media and computer generated art in his spare time.

Geneviève Bastien has been involved in the wireless communities of Montreal and the province of Quebec since 2009. With île sans fil and the Alliance of wireless communities of Quebec, she helped develop the software tools to manage the communities' portal and connectivity. She's now a member of Réseau Libre, a young community who seeks to create an alternative community-owned network in Montreal, using mesh networking technology. She's mostly working on the software tools and technology, making it more accessible to people so the network can spread more easily.

Edwin José Basto is a 30-year-old electronic engineer from Colombia. He specializes in wireless telecommunications, researches technological development, advises on spectrum regulation topics, and speaks in academic congress in different Colombian universities. He has more than six years of experience in the field, and currently works with Alcatel – Lucent.

Hamed Behravan has more than a decade of experience in social and multimedia communication with a focus on Iran. Hamed has played a key role in the development of several mobile apps that allow the Iranian users access censored content and have secure communication among themselves and externally. He has designed and distributed multiple manuals on Internet freedom and ways to bypass filtering in hostile environments and has personally trained Civil Society Activists on Cyber Hygiene and Digital Safety in such locations. As an experienced international video journalist Hamed has traveled to more than 20 countries, including Iraq, Afghanistan, Israel, Palestine, Turkey, Japan, Armenia, India, Uganda, and Yemen and has written, covered, and produced several hundred original stories in a broad range. Hamed currently leads multiple Iran focused civil society projects and produces an international TV show with a heavy focus on ICT.

Bastian Bittorf lives in Weimar, Germany. He runs his own wireless company "bittorf-wireless." He has built Freifunk nodes in the city Weimar since 2003 and is a member of Freifunk association for 10 years. Bastian focuses on internet access in villages without DSL connectivity & hotels based on ad hoc WiFi networks.

Greg Bloom was the Communications Guy at Bread for the City, one of the largest social service organizations in Washington D.C., from 2008-2012. Greg helped launch the Broadband Bridge, an initiative to "hack" the District of Columbia's municipally-owned 100-gigabit fiber-optic network by accessing it through local Community Anchor Institutions and opening it up through community wireless networks. Tragically, 'the Bridge' collapsed before it ever really got off the ground. He was a founding coordinator of the local Code for America Brigade (Code for DC) and has organized a number of DiscoTechs (Discovering Technology Fairs) hackathons, and data frolics. This year he has undertaken an open data research residency studying community resource directories with Provisions Library at George Mason University, and he has received certification as a 'cooperative developer' by the CooperationWorks! Cooperative Business Development Program.

Peter Bloom holds a BA in Urban Studies from the University of Pennsylvania and is the founder in 2002 and former director of Juntos, the first organization in Philadelphia dedicated to organizing and defending the human rights of latino immigrants. In 2009 Peter began working with the Nigeria-focused citizen journalism project Sahara Reporters as a development consultant and media maker and lived in the Niger Delta region of Nigeria for two years working with local human rights NGO's and social movements on strategy and media production, where he co-founded the Media for Justice Project based outside of Port Harcourt. Since 2011 Peter has been coordinating Rhizomatica, an organization he started to promote new communication technologies and that helps run the first community owned and managed cell phone network in the Americas in the Zapotec community of Talea de Castro in Oaxaca. Peter is currently studying for a Master's degree in Rural Development at the Autonomous Metropolitan University in Xochimilco, Mexico.

Joseph Bonicioli is the president of the Athens Wireless Metropolitan Network (AWMN) Association. Joseph has been one of the few pioneers in the wireless community networks scene. He has been involved in wireless technologies for almost 10 years now and joined the Athens Wireless Metropolitan Network back

in 2004. During this time he has been elected twice the President of the Association's board and has been a key player in the development of one of the biggest wireless community projects in Europe. Now, Athens Wireless Metropolitan Network, together with all the other Greek interconnected wireless communities, covers most parts of central and south Greece.

Griffin Boyce works on Commotion Wireless networks as part of the Open Technology Institute, focusing on local apps, usability, and community engagement. He is an active open-source software developer, and also works to address privacy issues with the Cupcake Bridge project. His work has been featured in The Washington Post, Mashable, CNET, and others. His past research has focused on communication, privacy, and transgender health.

Bart Braem is a postdoc researcher at iMinds, an interdisciplinary research institute in Belgium. Bart is leading the iMinds efforts in CONFINE, the European FP7 project which develops and studies a testbed in community networks in cooperation with three community networks. Through CONFINE, Bart got in touch with the local community network Wireless Antwerpen / Wireless Belgium, through which he studies and contribues to that community network.

Georgia Bullen is a Field Operations Technologist with the Open Technology Institute at the New America Foundation. Based in New York, Georgia provides usability, planning and geospatial analytical support, as well as data visualization skills, to the OTI team and its community partnerships. Georgia supports the Red Hook Initiative Digital Stewards program in Brooklyn, NY, developing curriculum for building community wireless networks and local applications such as OTI's local mapping application: Tidepools (http://tidepools.co). In her previous work, Georgia worked on data visualization projects in the areas of social media, transportation logistics, economic geography, urban flows, and other large-scale urban issues. Her work focuses on the intersection of human-centered design, urban space, and technology. Georgia holds degrees in Urban Planning, Psychology and Human-Computer Interaction.

Tiwan Burrus grew up in the Red Hook community and has been living there for 20 years. He currently works at the Red Hook Initiative where he is involved as a Digital Steward and assists with the after-school programs for middle school children. He is a very creative person who enjoys working with his hands.

Jane Butler is President of the Foundation NetworktheWorld.org that stimulates and supports the growth of Internet access using wireless in the developing world. The Foundation supports deployment-led wireless training for those wishing to bring connectivity and the Internet into their local communities. She has recently edited and published version 3 of the book *Wireless Networking in the Developing World*. Jane is also a Director at University College London overseeing the industrial liaison and outreach work for the Faculty of Engineering. Prior to these roles Jane spent 25 years as a technology leader in the Internet industry. Jane has an Honours degree in Electrical and Electronic Engineering, is a Chartered Engineer and Fellow of the Institute of Engineering and Technology. She also works tirelessly to encourage young people, especially girls, to follow careers in Engineering, Science and Technology.

Michael Calabrese directs the Wireless Future Project at the New America Foundation's Open Technology Institute. Michael develops and advocates policies to promote ubiquitous broadband connectivity and more open spectrum use, including the reallocation of more prime spectrum for shared and unlicensed access. He currently serves as an appointed Member of the U.S. Department of Commerce Spectrum Management Advisory Committee (CSMAC) since 2009. He also served as an Invited Expert on the President's Council of Advisors on Science and Technology (PCAST) spectrum reform working group during 2011-2012, which recommended widespread dynamic spectrum sharing of all underutilized U.S. Government spectrum bands.

Sai Madhukar Dandekar is a legal professional with an academic bent, an aptitude for research, and a commitment to uplift the lower strata of society, particularly with reference to sharing and spreading of knowledge in fields of "Know your rights" and women rights. Associated with Voltas, a TATA group, Sai shares the group philosophy of "Giving back to the Society, what you got from it." Closely associated with various professional forums at domestic and international level, she is an active member of WISE India.

Brigitte Daniel is the Executive Vice President of Wilco Electronics Systems, Inc., an African-American privately-owned cable operation. For over 30 years, Wilco has provided affordable cable and technology services to low-income communities as well as commercial, governmental, and educational institutions, in Philadelphia. Ms. Daniel has helped create several substantial private-public partnerships that provide innovative solutions to address the digital divide within communities in the United States, and thus, position Wilco as a digital and broadband leader, specifically working on behalf of disadvantaged communities.

Professor Linda Doyle is Director of CTVR, the national telecommunications research centre in Ireland. She is a member of faculty in the School of Engineering at Trinity College, University of Dublin, Ireland. Her research is focused on new spectrum management regimes, cognitive radio and creative practices as research methodologies. Linda is a member of the Ofcom Spectrum Advisory Board.

Brian Duggan is an organizer and technologist working to spread understanding of collaborative tech support as a critical community need, comparable to health care. Brian co-founded Makerspace Urbana, central Illinois' hackerspace, and the Urbana-Champaign Mini Maker Faire. He works on privacy and security issues at the Open Technology Institute including an application to integrate Tor's Flashproxy into Facebook.

Nicolás Echaniz is a founding member of AlterMundi, programmer and self-taught permaculturer with more than ten years of work in community networks and appropriate technology. Nico started working with wireless community networks back in 2003. During the last two years he has co-developed the MiniMaxi network model and the AlterMesh firmware for easy deployment of ultra-low cost multi-radio mesh networks. He helped develop QuintanaLibre, one of the fastest growing community networks in South América.

Trevor Ellermann is a computer scientist who has spent the last several years supporting various human rights organizations and individual projects on the ground in countries and conflict zones around the world, include Afghanistan, Syria, Zambia, Colombia and Haiti. Each country has presented a unique challenge, involving computer networking, programming, and security. He has also given training on wireless networking in these countries.

Ellen Foster holds a BA in Physics and Astronomy from Vassar College and is currently a doctoral student in the Science and Technology Studies program at Rensselaer Polytechnic Institute. Her current research interests include creative re-use of technology, critical technical practices, and sites of skill-sharing through informal educational practices.

Serge Fundi Etelembongo holds a Diploma in Electrical Engineering and Telecommunications from the Superior Institute of Applied Techniques Kinshasa, Democratic Republic of Congo (DRC). For five years he has participated in development studies and ICT standardization of the International Telecommunication Union. He is responsible for the non-governmental organization Action Awareness on New Technologies of Information and Communication (ASNTIC) whose mission is the dissemination of ICTs for socio-economic development to poor people in the DRC. In January 2012, he took part in the low-cost and low-power wireless technologies training for developing countries organized by the International Telecommunication Union and the Multinational School of Telecommunications in Dakar. Today, he is working as Independent Consultant to support DRC institutions in the development of ICT, and to inform and educate the Congolese people through ASNTIC on the importance of ICT as a tool for social and economic development. He is also active in the development of low cost wireless and mobile technologies to encourage accessibility to the Internet and other ICT services for development.

Paul Fuxjaeger works at the Telecommunications Research Center Vienna (http://www.ftw.at) as a researcher in the field of wireless mesh networks with a focus on cross-layer optimization. He is currently contributing to an open-source project which aims to replicate an IEEE802.11n/ac stack using software-defined-radio. He is a member of funkfeuer Vienna and also quite passionate about federated online-social-network architectures.

André Gaul is a community network enthusiast and PhD student in mathematics at TU Berlin. In 2004 he began exploring free software-powered WiFi routers and initiated a local Freifunk community in Erlangen in 2007. Since 2009 André lives in Berlin and contributes to Berlin's Freifunk network. In 2012 he began working on a global, scalable and decentralized node database and map for community networks. He's now collaborating with Nico Echániz from AlterMundi on 'libremap.'

Ryan Gerety is a senior field analyst at the Open Technology Institute, where she supports OTI's Commotion Wireless project deployments internationally. Previously, Ryan worked for Social Compact, where she organized stakeholders around innovative community research. She has worked as a programmer and analyst for a number of nonprofits, startups and academic institutions. Originally from New Mexico, Ryan holds a Bachelor of Computer Science with an emphasis on complex adaptive systems, and an M.A. in political science with a focus on the political economy of development and social movements in Latin America.

Jesica Giudice, a co-founder of AlterMundi, has organized many free software events, like the Basic Talks Day, the Software Freedom Day and the Latin American Free Software Installation Festival at the National Technological University. She is a member of LaVecindaria, a collective of research and experimentation in appropriate technologies and sustainable local development. She is co-designer and trainer of the Arraigo Digital project from the National Ministry of Education, a training program in communication and free technologies for public schools. She is also co-founder and administrator of QuintanaLibre free community network. Jesica focalized several workshops and talks about free networks around the country in Jujuy, Córdoba, Misiones and Buenos Aires and in the regions of Cundinamarca and Tolima in Colombia.

Matt Hampel has worked with nonprofits, newspapers, universities, and other organizations to build tools for the public good. Most recently, he was a Code for America Fellow in Detroit, and co-founded LocalData, a project to bring data collection tools to local communities.

Robert Horvitz has been involved in various aspects of spectrum policy for 35 years, first as a journalist then as a public interest advocate. Author of the "Local Radio Handbook" (Internews, 1991), he was the Soros Foundations' specialist in radio for Eastern Europe in the 1990s. In 2005 he founded the Open Spectrum Foundation (registered in Amsterdam) and in 2009, he co-founded the Open Spectrum Alliance. In 2011 he co-authored a major study for the European Commission on the value of "shared spectrum access." A graduate of Yale, he has lived in Prague since 1991.

Dr. Thomas Hühn is a senior researcher at Technical University of Berlin. His research focus is on practical transmit power control and rate control in Wi-Fi networks. A member of Freifunk for 10 years, Thomas started to build Freifunk nodes as main technician in the village of Sundhausen in 2003. Thomas planned, built and operates a 100-node Freifunk network to provide Internet access in four villages without DSL connectivity.

Daniel Iland is a PhD student in the Mobility Management and Networking (MOMENT) Laboratory at the University of California, Santa Barbara, creating wireless network technologies for developing regions. His research includes designing and building low cost local cellular networks, using open source telephony projects like OpenBTS and FreeSWITCH. Designing cellular networks to meet the needs and realities of rural areas requires extra consideration of backbone communication links, solar power solutions, and more.

Gui Iribarren has been involved for the past two years in the development of the "MiniMaxi" community network model, designed from a Latin American perspective, for small towns and digitally excluded areas, using very low-cost, multi-radio mesh nodes. Spanning a wide range of activities, from dealing with the social aspects of the local DeltaLibre network, to doing firmware development, always strives to collaborate with other projects, and strengthen global links between the different communities.

Grady Johnson is a program associate with the Open Technology Institute at the New American Foundation where he works on the Commotion Wireless project, and writes on issues ranging from spectrum policy to privacy and transparency. Before joining OTI, he was part of the Association for Progressive Communications,

working with human rights defenders and activists on secure communications, and on issues related to Internet governance. Grady is an editor of and contributor to GenderIT.org, an organization that supports women's and LGBT groups in digital rights advocacy and secure communications.

Ulysses Jones III has been a resident of MorningSide on the eastside of Detroit, Michigan, for over a decade. As a member of MorningSide Mesh, he actively seeks to transform his community with new ways of communicating via the mesh network and increasing accessibility to the internet, "connecting neighbors one block at a time." He recently reinvented himself after a company buyout forced him out of a job, allowing him to pursue his passion as culinary chef.

Dr. Kanchana Kanchanasut brought the Internet to Thailand and has been actively involved in many Internet connectivity initiatives in other Southeast Asian countries since the 1980s. She directs the Internet Education and Research Laboratory at the Asian Institute of Technology (AIT) in Thailand, where she is also Acting Vice President for Research and a professor of Computer Science at its School of Engineering and Technology. Her current research focuses on challenged and emergency networks, digital media communication and tele-education. She earned her PhD in Computer Science from the University of Melbourne and her BSc from the University of Queensland, Australia. See more at: http://www.internethalloffame.org/inductees/kanchana-kanchanasut

L. Aaron Kaplan works for the Austrian domain registry as IT security analyst where he saves the internet from imploding on a daily basis. He is the founder of the FunkFeuer (http://www.funkfeuer.at) free wireless community network in Austria. FunkFeuer covers Vienna, Graz and many rural areas in Austria. Since its creation , FunkFeuer has been constantly expanding and innovating. Over the last years, Funkfeuer has been very active in the OLSR.org mesh routing development. Currently, Funkfeuer is a partner in the 4-year CONFINE EU project. In this project, Funkfeuer is building a large scale testbed for research in community wireless networking.

Danielle Kehl is a policy program associate in the Open Technology Institute at the New America Foundation, where she focuses on US broadband policy, Internet freedom, and ICT for development. Before coming to New America, Danielle was part of the policy team at Access (AccessNow.org), an international NGO which advocates for digital human rights. Prior to that, she was a Fulbright Fellow in Rwanda, where she taught English and worked on community development projects. She graduated from Yale University with a B.A. in history, concentrating on political and social movements in the 20th century.

Josh King taught himself programming on an old Commodore 64 before attending the University of Illinois and earning a Bachelor's in Philosophy with a minor in Computer Science. His strong record of using technology in the non-profit sector includes designing and administering the computer systems of the Urbana-Champaign Independent Media Center; volunteering as Network Engineer on the Champaign-Urbana Community Wireless Network Project (CUWiN); administering the Chambana.net Community Technology Project; helping to organize the International Summit for Community Wireless Networks; serving on the Champaign-Urbana Telecommunication Commission's Broadband Advisory Committee; and his current position as Lead Technologist at the New America Foundation's Open Technology Institute (OTI). At OTI, Josh works primarily on the Commotion Wireless Project, which aims to create a secure and distributed "device-as-infrastructure" platform for activists and communities to build their own communications networks.

Trevor Knoblich is a project director, consultant and author with FrontlineSMS, an award-winning software company that builds tools for managing text messages and data and winner of a 2011 Knight News Challenge award. Trevor serves as Director for Media Projects, advising organizations on issues of journalism, mobile technology, and citizen participation in news. He has worked as a federal policy reporter in Washington, DC, and has served as a global humanitarian response coordinator. He writes regularly about the nexus of international journalism, mobile technology, and the use of platforms for data collection.

Stephen Kovats is a Canadian cultural and media researcher with a background in architecture and urbanism, founding director of the 'r0g_agency for open culture and critical transformation', a transnational non-profit organisation. His interests are focused on open forms of digital collaboration, exploring the dynamic relationships between technological, political, and urban space and their application on the transformation of societal and cultural landscapes. These aims are pursued through r0g_projects including the Circumpolar Cultures and Technology Initiative, the YOGYA2015 Summit of Critical Making, and in particular the

#OSJUBA initiative to create Open Systems Solutions in the establishment of the new state of South Sudan.

Ulf Kypke-Burchardi lives in Berlin, Germany. He is a digital media engineer (Dipl. Ing. f. digitale Medien FH) and a member of the Freifunk association for 10 years (starting in 2003). He works with wireless technologies to deliver broadband to areas of Friedrichshain without cable or DSL access, maintaining a wireless longshot link in Brandenburg to provide broadband Internet access in villages without DSL connectivity, reverse engineering first Linux based Soc from Intersil to run ad-hoc in an OLSR mesh network expert, running and maintaining several Freifunk links on special locations, managing wireless networks for events and event locations to provide fast wireless Internet access to hundreds of participants.

Jeremy Lakeman joined the Serval Project in February 2011, bringing with him 12 years of commercial experience developing software, primarily for the financial services industry. Jeremy's interests lie in architecting and implementing novel software solutions to solve real problems, and thus was readily drawn to The Serval Project when approached by the founder, Dr. Paul Gardner-Stephen. He has been applying his skills at The Serval Project, identifying and implementing solutions to progress development and integration of the Serval Mesh software, as well as providing a leadership role for Serval's many project students, helping them to develop their skills and become integral and productive members of the team.

Xavier Leonard is a Senior Fellow in Emerging Technology with the SDSU Visualization Center. His work encompasses research, design and advocacy around communication technologies and policy. He was the founding director of Heads on Fire and the Heads on Fire Fab Lab. The program was selected as a national model in the US for teaching technology in out-of-school settings. In 2010, he created Designers for Humanity, a model for delivering science, technology, engineering and mathematics (STEM) experiences through service-learning projects aimed at fostering innovation and providing an engineering solution for a specific community problem. Xavier has been honored as a Z-Fellow of the Zero Divide Foundation, an Ideas Institute Fellow of the MIT Media Lab, and a TEC Champion by the United States Congress. His work has been supported by the Western States Arts Federation Fellowship; the Pennsylvania Council of the Arts; the Institute of International Education; the Pew Fellowship in the Arts; and New American Radio.

Dr. Preston F. Marshall is a Principal Wireless Architect at Google Inc., where he is involved in implementing cognitive radio, spectrum sharing, and responsive wireless architectures. He has been active in spectrum sharing and wireless as Executive Chair of the IEEE International Symposium on Dynamic Spectrum Access Networks (DYSPAN) conference series; Program Manager for the US Defense Advances Research Projects Agency (DARPA) dynamic spectrum research and experimentation; and was a major contributor to the US President's Council of Advisors on Science and Technology spectrum policy study, including testifying to the US Congress in its support. He holds a PhD in Electrical Engineering from Trinity College, Dublin, IE, and is author of two books on Cognitive Radio, including the recently released *Scalability, Density, and Decision Making in Cognitive Wireless Networks* (Cambridge University Press).

Rita Mendez works for the Florida Immmigrant Coaltion (FLIC) a statewide coalition of more than 30 member organizations and over 100 allies. She was part of the People of Color Techies Project, a one-year program of May First/People Link that helped participants learn about the open source movement and technologies. The PoC Techies learned Debian and had very interesting discussions about racism in technology.

Nat Meysenburg is a technologist at the Open Technology Institute who works on building and maintaining systems with privacy, security and freedom in mind. Nat has a background as a developer, systems administrator and tech activist. He draws on years of professional experience implementing Free and Open Source Software in a variety of settings.

Paul Muchene is a web start-up entrepreneur, and network engineer/systems administrator with over eight years of experience in the computing industry. A dedicated professional and a tinkerer of new technologies, Paul enjoys helping people find unconventional solutions to challenging technical problems. A thrice recipient of the Internet Society's fellowships to the Internet Engineering Task Force (IETF) and the Internet Governance Forum (IGF), Paul is also an articulate

speaker possessing solid communications skills. Currently he is the network lead of the Nairobi innovation space and nexus for the Kenyan tech community known as the iHub.

Luka Mustafa, a hardware enthusiast and hacker, is a believer in open source life and keen on pushing existing systems to their limits and repurposing them to do the unimaginable. He is actively involved in growing wlan slovenija community wireless network, developing sensor platforms and coordinating and deploying international wireless backbones. He is also a ham radio operator, electronics and telecommunication student, the developer of KORUZA—an open wireless optical (free-space) system VALET.

Abhinav Narain is a third year PhD student working with Prof. Nick Feamster at Georgia Tech. He has a Bachelors and Masters in Computer Science and Engineering from Indian Institute of Technology, Madras and is interested in building secure systems.

Leandro Navarro Moldes is an Associate Professor who joined the Universitat Politècnica de Catalunya–BarcelonaTECH as an assistant professor in 1988. He received his PhD in 1992. His research interests include the design of scalable and cooperative Internet services and applications. Leandro is the co-director of the Computer Networks and Distributed Systems research group. He is currently the scientific coordinator of: FIRE EU Large-scale integrating project (IP) CONFINE on "Community Networks Testbed for the Future Internet" (2011-2015); Erasmus Mundus Joint Doctorate in Distributed Computing EMJD-DC (2011-2019); and the national research project "Self-adapting distributed systems for the Future Internet", Principal Investigator (PI) for Planetlab at UPC (2010-2012).

Axel Neumann is a PhD student at the distributed system group of the Universitat Politècnica de Catalunya with a research focus on cooperation in open, decentralized, and heterogeneous computer networks. Being involved in various community network movements like Guifi.net and Freifunk with the objective to develop and establish solutions for free and open network infrastructures, he is dedicating his time to the development of the community-lab.net networking testbeds, the BMX6.net routing protocol, and the quick mesh project qMp.net. Currently, he is professionally working as a system developer in the European FP7 research project CONFINE via the NGO Pangea.org.

Diana Nucera has been working in media arts and technology for the past fourteen years. Her expertise crosses many borders encompassing popular education, community wireless mesh networks, media production, and collective organizational development. She is currently the Media and Technology Program Coordinator at Allied Media Projects in Detroit. Allied Media Projects (AMP), advances strategies for using media and technology to investigate, illuminate, and develop visionary solutions to the crises faced by our communities.

Sven Ola lives in Berlin, Germany. He is an information specialist (documentalist) and technical prime of the first Freifunk OpenWRT image for Linksys Routers. He is a member of the Freifunk association. Sven has since maintained the Freifunk OpenWRT image for several years. He is an OLSR mesh network expert running and maintaining several Freifunk links on special locations.

Katherine Ortiz is a lifelong resident of the Red Hook community where she serves as Digital Steward. She has a two-year-old son, who inspires her to do better every day. Her life goals include returning to college and to find a way to live comfortably with her son.

Dillip Pattanaik currently holds the position of Team Leader at Information Resource Management (ICT4D of OSVSWA, an NGO) as well as Secretary General for South Asian Youth Climate Coalition (SAYCC) and based in Orissa State of India. Reiterating his commitment to ensure and enhance access of rural/urban/tribal women and children to Information Technology, he has gathered a lot of experience at the grassroots level. As Vice President of Women in Science and Engineering (WISE India), he has proved his extensive and intensive understanding for exploring new frontiers and vistas of learning in the interest of women engineers and scientists. He is also chairing a position at CIO-IAC (International Academy of Chief Information Officers) and a development consultant.

Ermanno Pietrosemoli is currently a researcher at the Telecommunications/ICT for development Lab of the International Centre for Theoretical Physics in Trieste, Italy, and president of Fundación Escuela Latinoamericana de Redes "EsLaRed", a non-profit organization that promotes ICT in Latin America through training and development projects. EsLaRed was awarded the 2008 Jonathan B. Postel Service Award by the Internet Society. Ermanno has been deploying wireless data communication networks focusing on low cost technology, and has participated in the planning and building of wireless data networks in Argentina, Colombia, Ecuador, Italy, Lesotho, Malawi, Mexico, Morocco, Nicaragua, Peru, Spain, Trinidad, the US, and Venezuela. He has presented in many conferences and published several papers related to wireless data communication and is coauthor and technical reviewer of the book "Wireless Networking for the Developing World" freely available from wndw.net.

Jessie Posilikin is a passionate advocate for community technology projects. In her professional life, she currently works at the Legal Services Corporation, where she supports users to become stronger users of technology, with the ultimate goal of improving access to justice across the US. Through her recent work at Bread for the City, a DC-based social services provider, Jessie increased technology adoption within the organization, and advocated strongly for community access to one of the fastest municipal broadband networks in the United States.

Julian Priest is an artist living and working in New Zealand. He works with participatory and technological forms and recent work explores relationships to different infrastructures including time, energy, security, health and communications. He was co-founder of early wireless freenetwork community Consume.net in London. He worked with independent research framework Informal and co-founded policy intervention OpenSpectrum UK to advocate an open spectrum in the public interest, in Europe and the UK. He is director of The Greenbench and is a board member of the Aotearoa Digital Arts trust.

Matthew R. Rantanen is the Director of Technology for the Southern California Tribal Chairmen's Association (SCTCA) and Director of the Tribal Digital Village (TDV) Initiative that was started back in 2001 designing and deploying wireless networking to support the tribal communities of Southern California. Matthew serves as Chairman of the Board of Directors for Native Public Media (NPM). He was named to the FCC Native Nations Broadband Task Force by FCC Chairman Julius Genachowski. Matthew has worked with National Congress of American Indians (NCAI), New America Foundation, FreePress, Media Access Project, and the FCC rural ITI conference in collaborations to get broadband deployed to the unserved communities and help clear the path with rule making and policy to enhance these efforts.

Robert Rattle is an independent researcher, consultant, author, and scholar based in Canada with interests in sustainable consumption, social determinants of health, Health Impact Assessment, Internet and communication technologies, and globalization. His work integrates diverse disciplines to better understand the impacts and consequences of societal decision making, and to develop rich and informative perspectives on the costs and benefits of these decisions, their socio-political underpinnings, and the co-evolutionary nature of socio-technical transitions.

Preston Rhea is a field analyst for the Open Technology Institute at the New America Foundation. He supports OTI's Commotion Wireless project deployments in Detroit, Michigan and Red Hook in Brooklyn, New York. Preston also started a community mesh network in the Mount Pleasant neighborhood of Washington, DC. Preston holds a bachelor of science degree in electrical engineering from the Georgia Institute of Technology. Preston also studied at the Universitat Politècnica de València in Valencia, Spain, and spent five years in several countries working with the global student-run organization AIESEC.

Ramon Roca is an activist for a free telecom network. With 25 of experience in corporate IT, Ramón is the co-founder in 2004 of guifi.net, a "Bottom Up Broadband" initiative where the users supply themselves with the telecom infrastructures, going without the traditional operators. guifi.net is already recognised as one of the most important initiatives in this field, and today its network is 30.000 kilometers long and connects 18.000 families, first via wireless link and now via fiber optics too.

Alicia Rouault is an urban planner and founder of LocalData, a civic startup simplifying place-based data collection and visualization. Winner of the 2012 Knight News Data Challenge and former Code for America Fellow, Alicia has worked in planning and technology with Sasaki Associates, MIT's Civic Data Design Lab, MIT's senseABLE city Lab, the Architectural League of NY, SF Economic & Workforce Development, City of Newark, and Pratt Center. Alicia holds a dual B.A. in Political Science and Ethics, Society & Law from University of Toronto and studied planning at the Masters level at Pratt Institute and Massachusetts Institute of Technology.

Jenny Ryan, an incorrigibly nomadic cyberanthropologist gone gonzo, explores emerging movements rooted in the shared struggle to reclaim the commons, create public spheres through the cultivation of open spaces, and enable direct democracy through principles of federation and open source or Read/Write culture. Her past research ranges from an extensive ethnography of online social networking, to digital literacy skills for the 21st century, to the legal and ethical dimensions of problematic online content, to posthuman anthropological explorations of how the dead live on online. As an intern for the Open Technology Institute, her work enabled her to engage in rebooting the 510pen East Bay mesh project and coordinating with the Open Oakland Digital Divide group through interviewing organizations addressing access to technology in Oakland. http://jennyryan.net - @tunabananas

Suchisnata Sahoo is currently working as Research Associate – Gender and ICT project with IRMA-India (ICT for Development Division of OSVSWA). With a professional education degree in management, she has been pursuing action research on promoting entrepreneurial abilities among the marginalized and socially neglected women in rural Orissa state using Information and Communication Technology as a tool. Through her commitment to ensure and enhance access of rural and marginalized women to knowledge networks, she has gathered a lot of experience at the grassroots level. She was a speaker at the IS4CWN in Vienna, Austria.

Tony Schloss, Director of Media Programs at Red Hook Initiative, is an artist, educator and dedicated community member. Prior to his work at the Red Hook Initiative, Tony had a 10 year career as an audio recording engineer and producer. During this time he also taught songwriting and digital audio recording in area secondary schools. In 2010, re-dedicating himself to education and community development, Tony enrolled in the the Learning, Design and Technology Masters program at Stanford University. He then returned to Red Hook to put his education to work in the community he lives in and cares for deeply.

Julius Schulz-Zander is a research assistant in Prof. Feldmann's Internet Network Architectures group and is pursuing a Ph.D. in CS from the Technical University of Berlin. His research is centered around Wi-Fi and Software-Defined Networking. Julius received his Diploma degree in CS from TU Berlin in 2011 and he has more that 4 years experience with OpenFlow.

Huub Schuurmans graduated in Chemical Engineering from the Universities of Eindhoven (The Netherlands) and Waterloo (Canada). He held various positions at Shell International, mainly in the area of technology development and innovation. He set up the Netherlands Office for Science & Technology in Silicon Valley (California) for the Dutch Ministry of Economic Affairs and Innovation and was the project leader for the City of Leyden in the EU-sponsored SaveEnergy project (CIP-ICT-PSP-238882). He is a board member and one of the founders of the Wireless Leiden Community Network.

Russell Senior is currently President of the Personal Telco Project, a non-profit community wireless network based in Portland, Oregon. Russell got involved with Personal Telco in 2005 and became an officer in 2006, and President in 2009. He has helped develop firmware to increase capabilities and ease maintenance burdens, as well as a contributor to public policy discussions surrounding telecommunications policy at the local level in Portland. Russell is a programmer/scientific data analyst in his professional life, with 25 years experience managing, manipulating and analyzing data from a diverse array of studies.

Prashant Singh, a co-founder at LocalData, creates technology for citizens and communities. In 2012, he was a Code for America Fellow on the Detroit team. Prashant likes to make, tinker, and dirty his hands with software, bicycles, furniture, and whatever else will fit in his apartment. Before working on consumer technology, Prashant was a signal processing researcher.

Steve Song is the founder of Village Telco, a social enterprise that builds low-cost WiFi mesh VoIP technologies to deliver affordable voice and Internet service in underserviced areas. Village Telco was incubated during a three-year fellowship that Steve spent at the Shuttleworth Foundation in South Africa. Steve also works with the Network Startup Resource Center (NSRC) to develop strategies for expanding the utilization of wireless technologies through shared spectrum strategies to enable more Internet access Africa. Previously, Steve worked at the International Development Research Centre, where he led the organization's Information and Communication Technology for Development program in Africa.

Ritu Srivastava has over eight years of rich professional experience in ICT development, managing programmes and projects at different stake-levels of competency. She has been actively engaged with Information, Communication and Technology (ICT) for the last seven years. Her areas of interest, activity, and research include ICT at the grassroots level, internet governance, environmental issues, community development, open spectrum policy issues, etc.

Dan Staples is a hacker and activist from the US, where he primarily works on the CommotionQireless project at the Open Technology Institute. While his educational background includes a B.S. in Physics and a M.S. in Women's Studies, Dan's experiences include student organizing, feminist culture-jamming, independent journalism, information security, and circumvention technology. Dan is a member of the Baltimore Indypendent Reader, a co-conspirator with FORCE: Upsetting Rape Culture, and the author of MediaGrid and NOISE. His work can be found on http://disman.tl.

Tobias Steinicke is a masters student in CS at Technical University of Berlin. Since 2011 he works as a student worker on the Berlin Open Wireless Lab (BOWL) project in Prof. Feldmann's Internet Network Architectures group. He has followed Freifunk and OpenWRT for many years now. He also has a strong interest in Software-Defined Networking for Wireless, where he currently works with Open vSwitch. Previously, he worked on a MIMO-SDR platform, a resource management solution and measurement tools in the BOWL project.

Monique Tate is a devoted wife of 27 years, proud mother of three, and happy grandmother of one. She works alongside her husband in their MorningSide neighborhood association and in Detroit community activism to address technological access disparities. She worked for Chrysler Financial for 21 years then transitioned over to the non-profit arena, currently serving as Supervisor & Project Administrator for one of the Broadband Technology Opportunity Programs (BTOP) called Connect Your Community.

Nasha Taylor, Manager at the Center for Digital Inclusion and Technology (CDIT) at People's Emergency Center, oversees the CDIT academy that graduates a minimum of 150 technology earners each year. She combines her studies in Media with her experience in grassroots organizing to advance digital and media literacy initiatives to create competitive programming opportunities for PEC's West Philadelphia neighbors. Her research and coordination help to align CDIT as a resource hub to show ways that technology can strengthen families and serve communities. She holds a B.A. with Honors in Broadcasting, Telecommunications, and Mass Media from Temple University in Philadelphia, PA.

Dr. Apinun Tunpan earned his Ph.D. and M.S. in Computer Science from the University of Maryland. He has worked in the telecommunication industry, academia, and the private sector. Currently he is Senior Research Specialist at the Internet Education and Research Laboratory (intERLab), Asian Institute of Technology, where he conducts his research in Community Wireless Mesh Networks (CWMN), Vehicular Ad hoc Networks (VANET), and Robotic Ad hoc Networks (RANET). He is particularly interested in how simple, minimalistic and affordable CWMN technologies may serve as a new means to deliver modern educational contents such as interactive e-books and video on demand.

Seamus Tuohy is an associate technologist for the Open Technology Institute at the New America Foundation where he works on the Commotion Wireless mesh networking project. He takes a keen interest in threat modeling, learnable technology, computer security, Free Software, and facilitated digital spaces.

Brough Turner is a communications industry engineer and entrepreneur. He founded netBlazr Inc. (http://netblazr.com), a startup working to change the landscape for broadband Internet access in the US urban areas. Previously Brough was co-founder and CTO of Natural MicroSystems and NMS Communications. Since 2001, Brough has focused on wireless infrastructure and mobile applications.

Tan Vu has a Bachelor's in Biological Sciences and Psychology, with a minor in Spanish, from University of California, Irvine. He went on to obtain a Master's of Public Health from the University of California, Berkley. Also, Tan is a CompTIA A+ and Microsoft certified professional. Mr. Vu is also cochair of Technology Learning Collaborative, Philadelphia's first professional association dedicated to innovation in digital literacy and programming, an outgrowth of the KEYSPOTS initiative. Recently, he was recognized as the Philadelphia Business Journal's 2013 Top IT Pro for the nonprofit and government agency category last month. He was selected for the top award over finalist from two large insurance non-profits and an educational institution. Mr. Vu's work at PEC spans ten years, and includes the establishment of 20 KEYSPOTS public computer labs under the Broadband Technology Opportunities Program starting in 2011.

Ben West, besides co-founding the community mesh WiFi network WasabiNet in St. Louis, has led a diverse career as a technologist, from the Human Genome Project, to terabit capacity network routing, to home automation for the physically disabled, to innovative video gaming technology. Ben's focus in recent years has been collaborative and community-based technology projects.

Isaac Wilder is co-founder and Director of the Free Network Foundation (FNF), a US group that develops tools and provides resources for community network operators. Since its inception two and a half years ago, the FNF has provided tech knowhow and logistical support for network deployments across the United States. The networks that the FNF helps support currently serve as thousands of individuals primary means of connectivity.

Anne Wizorek is the founder and editor-in-chief of kleinerdrei.org, a German blog about feminism, politics, media criticism, nerdery and pop culture, whose content is driven by <3. Wizorek's activism focuses on education around rape culture and gender equity, and she uses online tools to achieve offline social change. In 2011, Wizorek was part of a team that brought the Slutwalk protest to Berlin. In 2013 she started the Grimme Online Award-winning Twitter ad-hoc campaign #aufschrei, which brings everyday sexism and sexual harassment to light. Wizorek is a former co-organizer of re:publica, Germany's premier online/social media conference. When she isn't busy making the world a better place, Wizorek advises corporations and non-profits on social media strategies as a freelance digital media consultant.

Marco Zennaro is a researcher at the Telecommunications/ICT4D Lab of ICTP and amember of the Clommunity project. He has extensive experience in wireless and sensor networks and has contributde to training and installations in many countries of Africa and Asia. Pau Escrich works with guifi.net and leads the qMp node distribution. He also founded Sants Mesh.

Food and Drink

Breakfast will be served one hour prior to the start of the first plenary session each morning.

Lunch will be served after the end of the second session of the day. The lunch break will be 90 minutes.

There are 30 minute breaks between each session. Coffee will be available.

Acknowledgements

We would like to thank the IS4CWN 2013 planning team for their hard work throughout the year. From the New America Foundation's Open Technology Institute: Andrew Bolden, Darby Hickey, Sarabrynn Hudgins, Grady Johnson, Danielle Kehl, Patrick Lucey, Bincy Ninan-Moses, Preston Rhea, and Dan Staples, with additional thanks to Thomas Gideon, Andrew Reynolds, Chris Ritzo, and Sascha Meinrath. Extra special thanks to local planners Monic Meisel, Juergen Neumann, and Niels (AKA "keiner").

We would also like to thank our volunteers from Freifunk and c-base, e.V., as well as the Digital Stewards from Red Hook and Detroit. We express our appreciation to Michael Stognienko from Heinrich Boell Stiftung and Geraldine de Bastion from newthinking communications GmbH.

For logistical support, we thank the staff at the European Theater Institute, Karger & Karger Catering, and Mary Memminger, HBP Inc.

Finally, we would like to thank all of the keynotes, presenters, and attendees for making this conference possible.
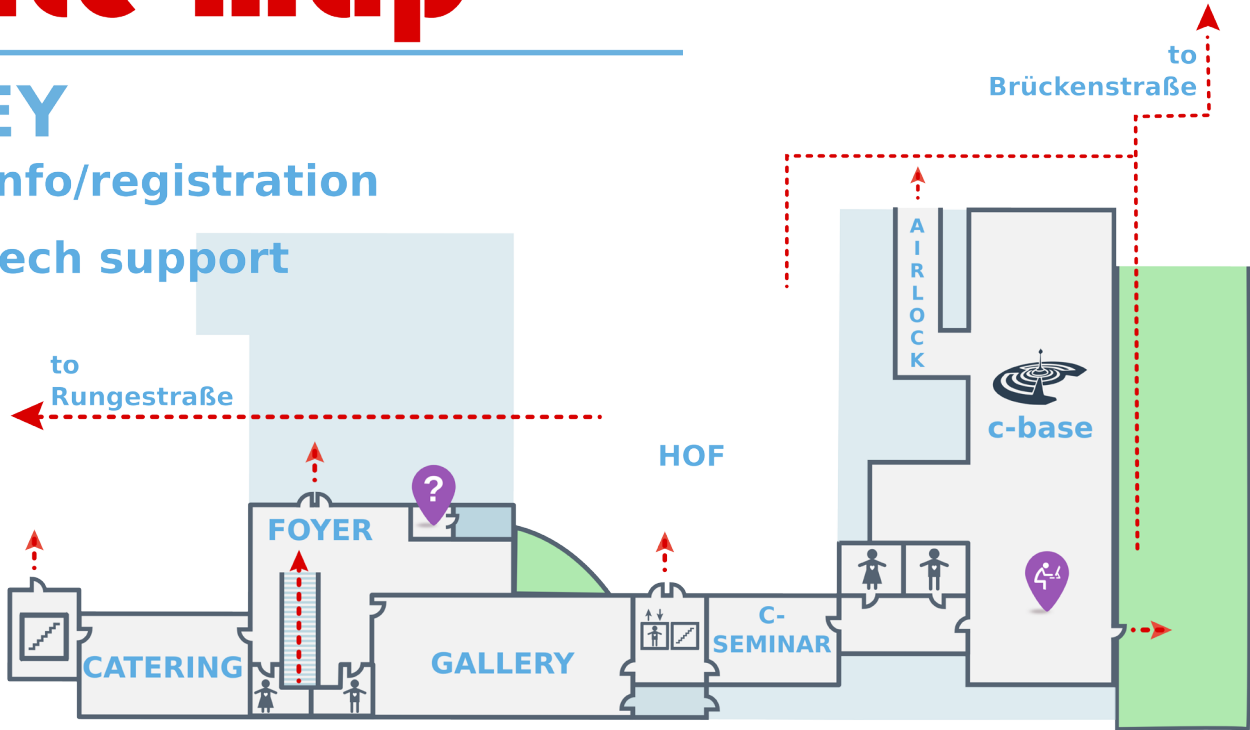
Agenda Quick Reference

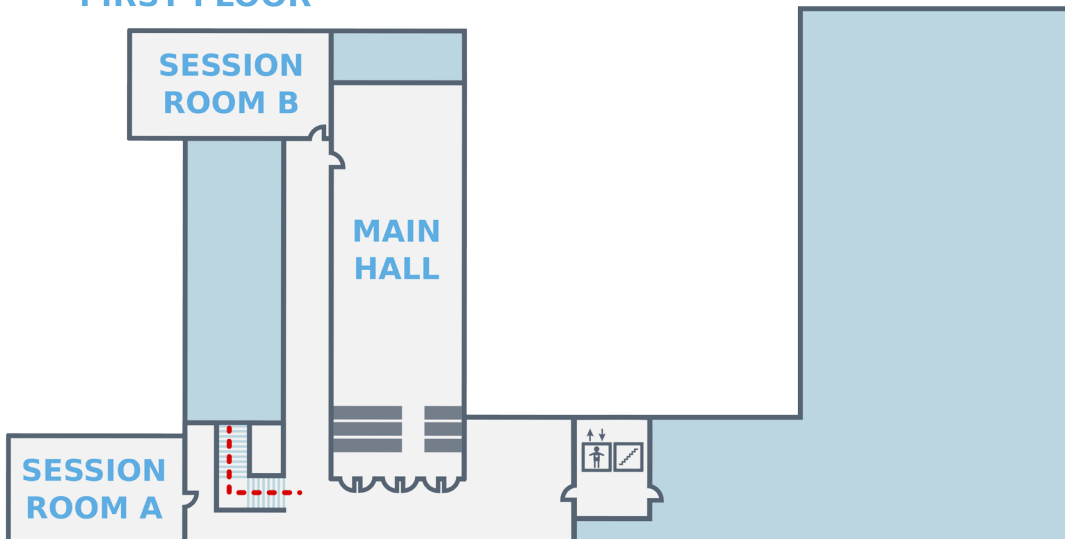|	Main Hall	Session A	Session B	Hack Lab	Gallery
Wednesday					
9:30 AM	PLENARY Sascha Meinrath Bjorn Bohning				
11:00 AM	Women and Community Wireless	Alternative Business Models	Tech Showcase I	GENERAL HACK	CWN Documentation Fair
1:30 PM	Measuring and Optimizing Network Performance	Clommunity: A Cloud Solution for Community Networks	Networks in Conversation I	Pico Satellites	UNCONFERENCE
3:00 PM	Solutions to Break Iran's Digital Blockade	Learning how to teach (how to build a network)	Community-based technology for social justice	Empowering Local Networks to Collect Local Data	CWN Speed Networking
4:30 PM	PLENARY Freifunk Retrospective				
Thursday					
10:00 AM	PLENARY Mahabir Pun Joana Varon				
11:30 AM	Coalition-Building for CWNs	Red Hook WiFi	Tech Showcase II	Local Apps Hackathon: Location versus Locality	CWN Speed Networking
2:00 PM	Beyond Connectivity	Governing the Wireless Commons	Tech Showcase III	Local Apps Hackathon	UNCONFERENCE
3:30 PM	User Support Driving CWN Adoption	Wireless 4 Communities: Rural India & Spectrum	Advances in Mesh Tech	Local Apps Hackathon: Video Streaming	UNCONFERENCE
5:00 PM	The Last Decade For Community Wireless?	Free Community Networks: Latin American Perspective		Local Apps Hackathon	UNCONFERENCE
Friday					
10:00 AM	PLENARY Amelia Andersdotter Virginia Eubanks				
11:30 AM	Access: The Fight in Developing Countries	CWNs and Disaster Communications	Tech Showcase IV	Ubiquiti Hardware Workshop	UNCONFERENCE
2:00 PM	Origins and Outlook: Ten Years of CWNs	Scarcity to Abundance: Underutilized Spectrum	Networks in Conversation II	OpenWRT on Raspberry Pi	CWN Documentation Fair
3:30 PM	Community Networks as Antidote to Surveillance	Green Technologies in CWNs Domain	Tech Showcase V	GENERAL HACK	UNCONFERENCE
5:00 PM	PLENARY Daniel Kitscha Juergen Neumann				

Site Map

KEY

📍 **info/registration**

📍 **tech support**

to Rungestraße

FOYER

HOF

to Brückenstraße

AIRLOCK

c-base

CATERING

GALLERY

C-SEMINAR

GROUND FLOOR

FIRST FLOOR

SESSION ROOM B

MAIN HALL

SESSION ROOM A

RIVER SPREE

IS4CWN berlin
2-4 Oktober 2013

Auf Wiedersehen

www.wirelesssummit.org
www.oti.newamerica.net
www.freifunk.net
www.c-base.org
www.boell.de

international summit for community wireless networks