

# Women in Science and Engineering in Krakow: From Legends and Saints to Pioneers in Emancipation

EMC Europe 2023, September 4 – 8, Kraków, Poland



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*Disclaimer:*

*This talk is intended to spark interest. It is by no means exhaustive. The selection of historical figures is arbitrary. The above snapshot is from the EMC Europe 2023 website. Recent photos on slides 7,11,12 are from the presenter. The remaining maps and portraits, if not explicitly annotated, are borrowed from Wikipedia.*



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# My Roles:



co-founder 1997

Executive VP since 1997

President since 2017



until 2017



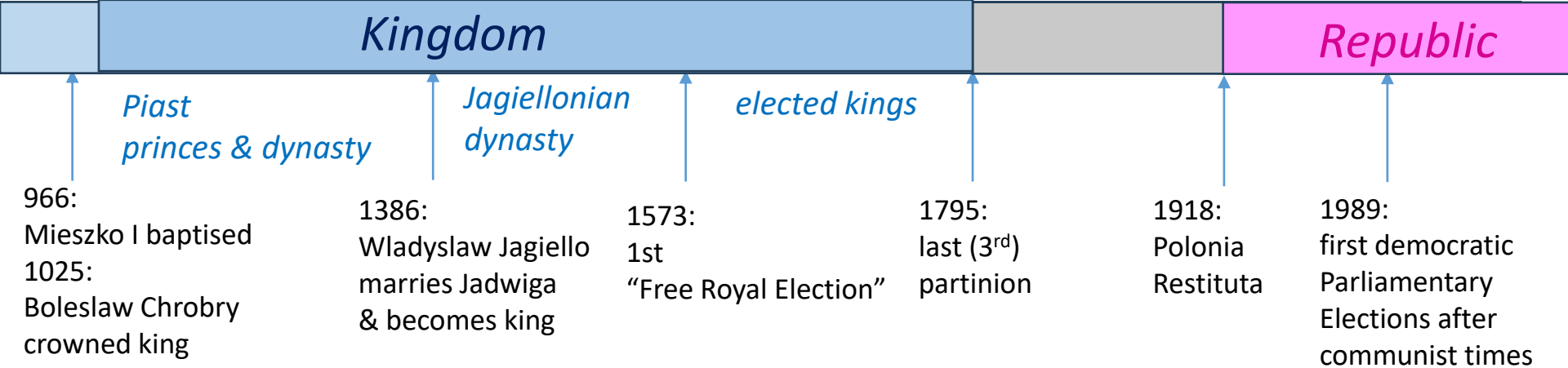
- since 1990s...
- WiE since 2000
- Vice-Chair MTT-S TC 1 Field Theory & Computational EM Committee
- MTT-S Publications Committee
- JMMCT: Associate Editor since 2020, SI: "Women in Computational Physics"
- former Vice-Chair of:
  - PS AES/AP/MTT JC 2007-2009
  - PS WiE AG 2020-2022



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# Timeline:



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# St. Kinga (1234 - 1292)

Hungarian princess, daughter of King IV Bela

wife of Boleslaw Wstydlivy (*latin: Pudicus*):

- prince of Sandomierz and Krakow,
- last prince of Malopolska (Lesser Poland) line of Piast dynasty
- buried in St. Francis of Assisi Church in Krakow – **worth visiting!**

Kinga:

- engaged to Bolesaw at the age of 5, married “de futuro” at 12
- joined secular convent of St.Francis
- joined St.Clara convent afret Boleslaw’s death

legend:

- dropped her ring into a salt mine in Hungary & recoved it in Wieliczka

facts:

- brought salt miners to Wieliczka and Bochnia,
- helped rebuild the country after Tatars’ attacks,
- salt mining began to blossom around Krakow

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St. Kinga by Matejko

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for Open Version*

God the Father stained window  
by Stanislaw Wyspianski  
at St.Francis

# St. Jadwiga (1373/74 - 1399)

King of Poland (*in regem Poloniae coronata*)

but used “Queen” on everyday basis (*Hedvigis regina Poloniae, princepsque Lithuanie suprema et heres Russiae*)

daughter of King Ludwik Wegierski (hung. *Nagy Lajos* , Louis I of Hungary – Angevin dynasty, branch of Capetian dynasty)

grandson of King Wladyslaw Lokietek of Poland and nephew of Kazimierz Wielki – **last of Piast dynasty**

Jadwiga:

- 1378 engaged to Wilhelm Habsburg
- 1384 arrived in Poland and crowned as king and ruled without an official regent!
- 1386 married to Wladyslaw Jagiello (1352/62 – 1434), who:
  - got baptised for the purpose of the alliance
  - started the Jagiellonian dynasty in Poland & was longest ruling king of Poland
  - famous for Grunwald battle with Teutonic Knights

Jadwiga:

- made her court centre of intellectual life
- stimulated translation of St. Florian Psalter
- funded Polish & Lithuanian students at Karl’s Univ. Prague
- **donated her wealth & jewellery to Jagiellonian University**

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# Queen Bona Sforza (1494-1557)

Bona Sforza d'Aragona

daughter of Gian Galeazzo Sforza di Milano and Isabella d'Aragona

Bona:

- 1518 married to Zygmunt Stary (Sigismund the Old) & was crowned Queen of Poland  
*Bona Dei gratia regina Poloniae, magna dux Lithuaniae, Barique princeps Rossani, Russiae, Prussiae, Masoviae etc. domina.*
- 1520 gave birth to Zygmunt II August, the **last king of the Jagiellonian dynasty**

Bona was a fierce politician & great patron of arts:

- brought Renaissance artists to Poland, who renovated Wawel Castle and spread into the country
- gave scholarships to Polish student abroad
- modernised Polish cuisine - brought vegetables (“*włoszczyzna*” )
- modernised the economy (construction of towns & bridges, developed wastelands)
- developed defense systems (e.g. Bar stronghold in today's Ukraine)

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# STEMA– Science, Technology, Engineering, Mathematics, Arts

Helena Modrzejewska (Modjeska) (1840 Krakow – 1909 Newport Beach, CA)

top actress of her time, having won on all stages of Poland, conquered the US:

- not only played but *brought* Shakespeare to US!
- started by farming in Anaheim, US
- set up her own theatre company,
- also costume designer
- co-designed her house “Arden”, CA,
- mother of Rudolf (Raph) Modjeski  
*“America's greatest bridge builder”*

politics: 1893 World’s Fair Congress in Chicago

- gave a lecture on the situation of women in Poland under the Russian & Prussian regime, after which was prohibited from re-entering Russia (incl. Warsaw)



designed by Stanford White based on Helena’s vision  
- photos © M.Celuch, other graphics removed for Open Version

# Kazimiera Bujwidowa (1867 Warsaw – 1932 Krakow)

qualified as house teacher

enrolled for biology in “Flying University”

joined her husband’s biology lab at Jagiellonian University

1<sup>st</sup> World War: run hospital for Polish legion

1918: became chair of Division of Vaccine Production

activist : organised libraries & reading rooms for women & teenagers

initiated petitions to accept female students (1896 - first female students accepted)

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writer:

*Prawa nauczycielek z 1903,*

*Czy kobieta powinna mieć takie same prawa co mężczyzna z 1909,*

*O postępowym i niepostępowym ruchu kobiecym w Galicji z 1913 roku.*

<https://twojahistoria.pl/2018/04/12/polskie-emancypantki-kim-byly-i-jak-walczyly-o-prawa-kobiet/>



## Sources:

[https://www.krakow.pl/odwiedz\\_krakow/255901,artykul,szlak\\_kobiet\\_krakowa.html](https://www.krakow.pl/odwiedz_krakow/255901,artykul,szlak_kobiet_krakowa.html)



## Marta Adelajda Suchanek-Kłyszewska (1909 – 2008)

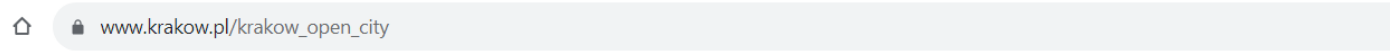
1936: first woman in Poland to receive “mining engineer” diploma

AGH – Akademia Górniczo-Hutnicza, Krakow

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# Sources:

[https://www.krakow.pl/krakow\\_open\\_city](https://www.krakow.pl/krakow_open_city)



# Disappointing Perception:





**Diana Reiter**  
1902 – 1943

*wiepodlega* | POLSKA KRAJOWA ORGANIZACJA INŻYNIERÓW

Jedną z pierwszych architektek w Polsce, członkini Związku Architektów Województwa Krakowskiego. Absolwentka WA Politechniki Lwowskiej. Jej projekt gmachu Biblioteki Jagiellońskiej\* zajął w konkursie III miejsce. Pracowała w biurze projektowym Inż. Kazimierza Kulczyńskiego. W 1941 r. trafiła do getta. Została zastrzelona w obozie koncentracyjnym w Plaszwowie na rozkaz komendanta obozu Amona Götha, ponieważ wyjaśniła mu przyczynę pęknięć na ścianie budynku koszar, powstałych przez użycie mokrych cegieł, które następnie zamarzyły na mrozie. Jej wstrząsająca, tragiczna śmierć została uwieczniona w wielu wspomnieniach Ocalałych z Holocaustu oraz w filmie *Lista Schindlera*.

Autorka krakowskich budynków: przy ul. Pawlikowskiego 16 [7] oraz ul. Beliny-Prażmowskiego 26 [8].

One of the first female architects in Poland, member of the Association of Architects of the Krakow Region. A graduate of Lviv Polytechnic National University. Her project won third place in a design competition for the Jagiellonian University Library\*. She worked in eng. Kazimierz Kulczyński's design studio. In 1941, she was relocated to the Krakow ghetto, and later shot in the Plaszwów concentration camp. Her execution was ordered by the camp's commander Amon Göth's purportedly because she pointed out to him the construction errors that led to cracks in the barracks' walls (bricks used were still wet, which caused water to freeze and destroy the walls). Her shocking, tragic death was mentioned in many Holocaust memoirs, and in S. Spielberg's 'Schindler's List'.

Photos taken yesterday at Planty:  
Polish Inventors alley,  
features **only 1 woman**



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# Our Actions:

First-ever Women in Microwaves at MIKON  
– Microwave & Radar Week, Warsaw, 2020



M. Celuch, "Women in Microwaves at MIKON: (Not) for the First Time [Women in Microwaves]," in *IEEE Microwave Magazine*, vol. 22, no. 7, pp. 78-82, July 2021, doi: 10.1109/MMM.2021.3070815.

Women in Science & Engineering at MIKON  
– Microwave & Radar Week, Gdansk, 2022



M. Celuch, "Women in Science and Engineering Matinee: WiSE at Microwave and Radar Week 2022 [Women in Microwaves]," in *IEEE Microwave Magazine*, vol. 24, no. 7, pp. 86-90, July 2023, doi: 10.1109/MMM.2023.3265521.

# Our Actions:



## IEEE Ukrainian Microwave Week Women in Engineering Meeting



Session WIE, Thursday, 17 November 2023, 15:00-17:00 Kyiv Time (14:00-16:00 CET)

<https://us06web.zoom.us/j/82785493650?pwd=RmxjU2sxRHFzT0Z1ei9NQVRmeWJlQT09>

Session Schedule in UkrMW (Kyiv) Time Zone:

15:00 **Welcome to WiE Session:** Dr. Malgorzata Celuch (Session Chair) and Dr. Mariya Antyufeyeva (UkrMW-2022 OrgCom Chair)

15:15 **Welcome to IEEE Communities:** Prof. Rashaunda Henderson (IEEE MTT-S President)

15:30 **Welcome to European Initiatives:** Janine Jost (EURICE)

**IEEE MTT-S Senior Talks:**

15:45 Prof. Jasmin Grosinger **Distinguished Microwave Lecturer, AdCom Secretary**

16:00 Dr. Kiki Ikossi **IEEE MTT-S – Women in Microwaves Executive Committee Member**

16:15 Dr. Agnieszka Konczykowska **Fellow, Member of Editorial Board of IEEE Proc.**

16:30 **Young Professionals:** Cerine Mokhtari (IEMN, FR) and Malgorzata Warecka (GUT, PL)

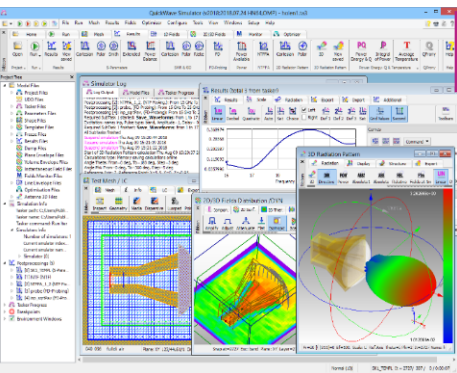
16:45 Open discussion (or **buffer time for interim discussions!**)

M. Antyufeyeva, "The 2022 IEEE 2nd Ukrainian Microwave Week,"  
in *IEEE Electromagnetic Compatibility Magazine*, vol. 11, no. 4, pp. 108-109, 4th Quarter 2022,  
doi: 10.1109/MEMC.2022.10058849.



# 26 years in a Nutshell

## R&D projects

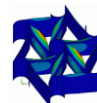


**Electromagnetic simulation & design software, 3D & BOR 2D tools**

**based on 300+ publications by: prof.W.Gwarek, IEEE Fellow, DML, Pioneer**



**FP6 SOCOT** – development and validation of an optimal methodology for overlay control in semiconductor industry, for the 32 nm technology node and beyond.



**FP6 CHISMACOMB** – development, modelling, and applications of chiral materials → EM validation of mixing rules



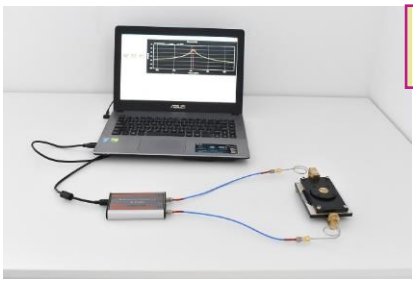
**Eureka E! 2602 MICRODEFROST MODEL** – innovative software-based product development tool for simulating and optimising heating and defrosting processes in microwave ovens



**FP7 HIRF SE** (High Intensity Radiated Field Synthetic Environment) - numerical modelling framework for aeronautic industry



**Eureka FOODWASTE** – developing new microwave treatment system for high water content waste



**Instruments for precise material measurements**

**based on 300+ publications by prof.J.Krupka, IEEE Fellow**



**ERA-NET MNT NACOPAN** – applications and modelling of nano-conductive polymer composites



**NGAM2** – designing an industrial device for thermal bonding of bituminous surfaces with the aid of microwave heating



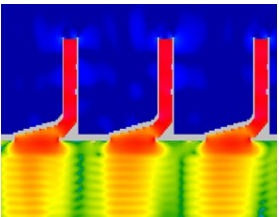
**MMAMA** (Microwave Microscopy for Advanced and Efficient Materials Analysis and Production) – EM modelling & characterisation for the development of high efficiency solar cells



**NanoBat** - developing a novel nanotechnology toolbox for quality testing of Li-ion and beyond Lithium batteries with the potential to redefine battery production in Europe and worldwide.



**ULTCC6G\_EPac** – development & application of novel ceramics for 5G & beyond  
**I4BAGS** – modelling & characterisation of ion-implanted battery & graphene-enabled devices



**Consultancy & design services based on EM expertise & tools**

**team of 10+engineers, 4 PhDs, 2 Profs**  
key areas: MW power appliances, customised resonators, antennas & feeds



# Acknowledgement

The research work of QWED team is currently co-funded by:



the *Polish National Centre for Research and Development* under contracts *M-ERA.NET2/2020/1/2021* and *M-ERA.NET3/2021/83/I4BAGS/2022*.



*M-ERA.NET 3* has received funding from the *European Union's Horizon 2020* research and innovation programme under grant agreements *No 958174*.

ULTCC6G\_EPac



We kindly acknowledge the collaborations with our partners in the above European projects.



We acknowledge the iNEMI “5G” partnerships for round-robin experiments and discussions.

Special thanks to all our industrial clients and partners for driving our developments and their kind permission to publish selected industrially-representative results.