

# First International Symposium on Lightning Physics and Effects



COST Action P18  
Vienna, Austria  
April 3-4, 2006

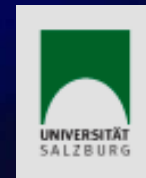


# European ball lightning research focus



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TECHNOLOGY

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*The Austrian ball lightning group*

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## **Project presentation**

1. COST P 18 and ball lightning
2. Assessment of research situation
3. Austrian research abstract
4. Chance instrumental records
5. European BL Survey
6. Project aims, COST call of interest

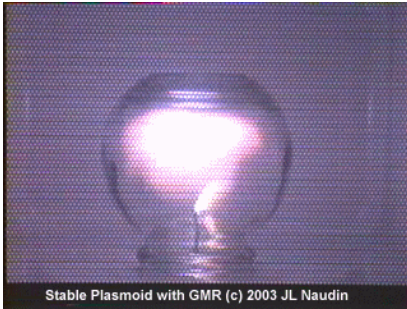


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## **1. COST P 18 and ball lightning**

*Memorandum of understanding*, March 2005:  
„unusual lightning discharges“, „near CG flash“,  
„reality not in doubt“, „several theories“, „no  
reliable photographic or instrumental recording“

Ball lightning no COST P 18 main goal, but  
associated to Working Group 2 phenomenology  
and modelling.



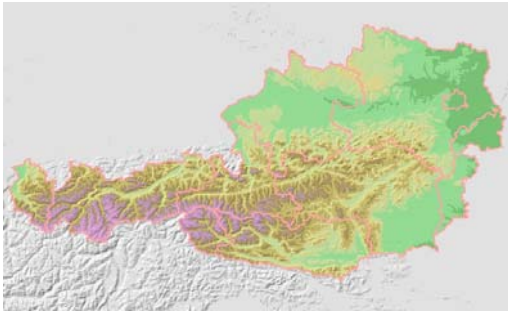
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## 2. Assessment of research situation

*Theories* – Rakov & Uman 2003 list 11 models with internal, 5 with external energy source.

*Case histories* – Several large data banks (USA, Russia, Japan), few field investigations.

*Lab simulation* – electrodeless discharge (Finkelstein), combustion (Barry), microwaves (Ohtsuki) etc. etc. *No consensual strategy.*



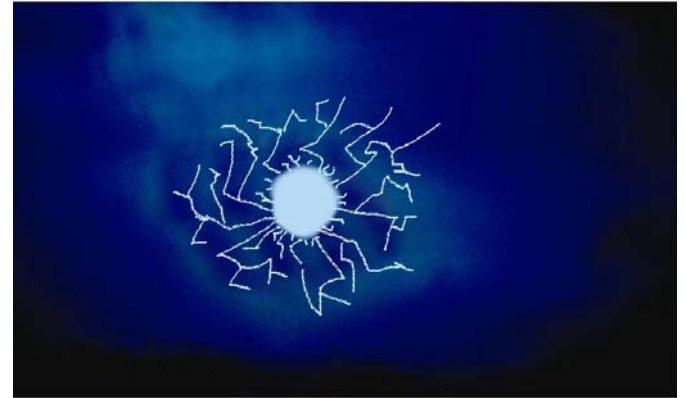
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### **3. Austrian research abstract**

30 years call-for-reports; first reports, mostly questionnaire survey, 5% field investigations - **Data bank** with over 500 entries (300 Austria)

Cooperation with *ICBL* since Tokyo 1988, 1993 Salzburg congress, 2001 **Evaluation** with ALDIS/OVE & Siemens funding, 2003/04 first **European Survey** on BL research.

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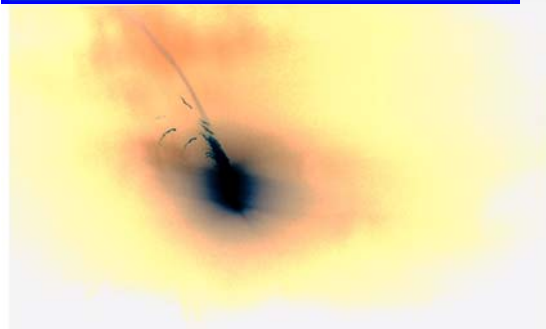
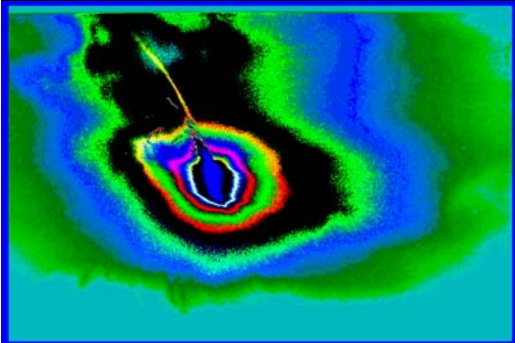


## **Austrian BL statistics** (selection)

- ❑ 85% in summer, peak 2:30-5 P.M.
- ❑ 70% +thunderstorm, 50% +flash
- ❑ 3-5 seconds duration, 25-30 cm size
- ❑ 70% red-yellow color, not blinding
- ❑ 30% inside buildings, 15% sound
- ❑ 40% terminal explosion

Keul & Stummer, Journal of Meteorology, 2002

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### **4. Chance records: Montafon photograph**

Fujica AZ1 lightning time exposures, summer 1978, midnight, St.Gallenkirch, Vorarlberg, Austria. „Fireball falling, crackling“, 2 seconds. No fireworks/rocket, complex discharge with sparks/drops.

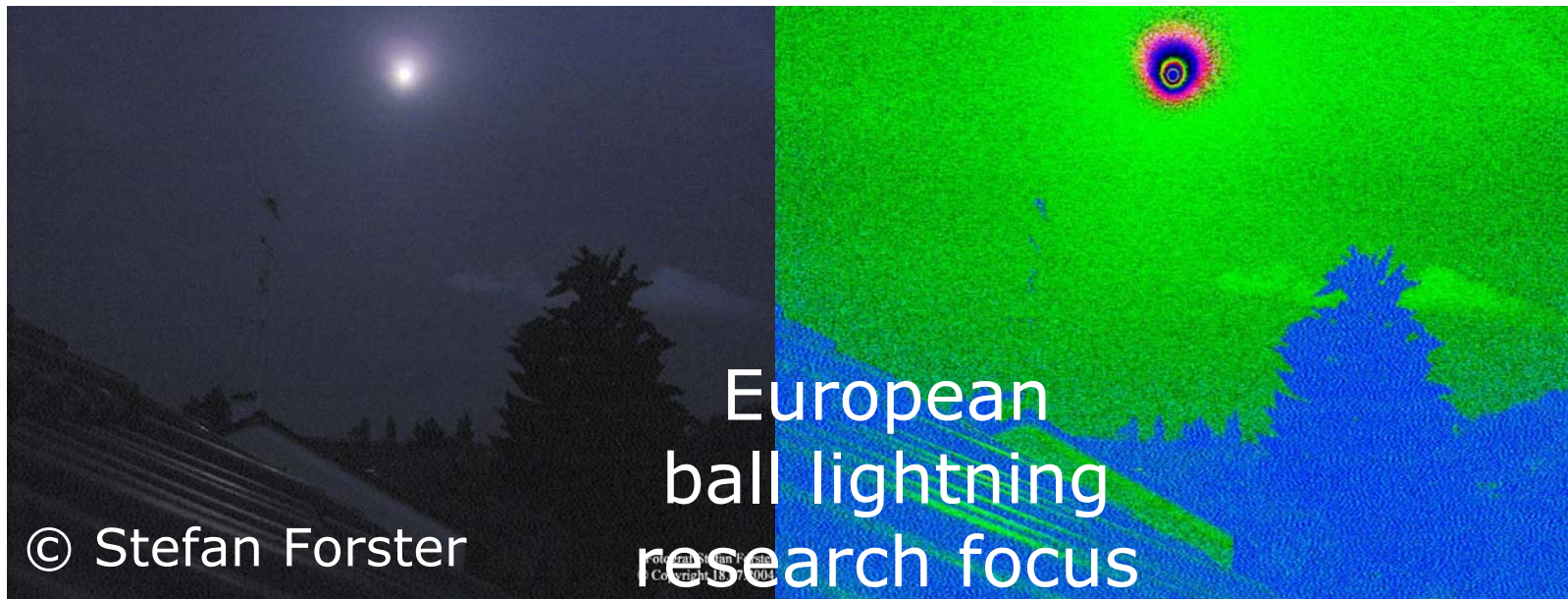
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**Zwönitz, Saxony,  
webcam record**

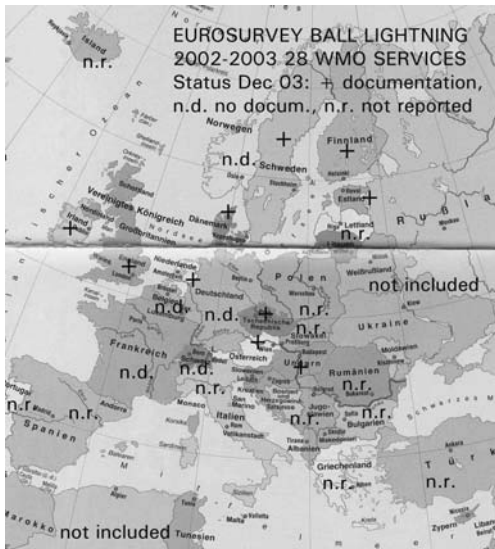
April 19, 2003,  
thunderstorm video  
6:44-48 P.M., object  
detected later on 56  
frames, 2" 240 msec,  
undulatory track, two  
flares, brown „haze“

Journal of Meteorology 2004





**Uzwil photograph** July 17, 2004, 9:30 P.M.  
Sony DSC-P12 digital picture, Uzwil, St.Gallen,  
Switzerland, Frontal passage, thunderstorms,  
white object, stationary 2 seconds, exploding.  
BL homogenous when enhanced, est. 1.5 meters  
Keul, Journal of Meteorology, 2005



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### **5. European BL Survey**

2003/04, 21 countries, shows

*BL frequent*: the Netherlands, Hungary, Austria,

*rare*: Denmark, Czechia, Estonia, Ireland

*BL research developed* - Finland, Sweden,

*Austria, interest* - Germany, Denmark, Italy,

the Netherlands, UK/Ireland, Hungary, Estonia

19 researchers from 15 countries answering

Keul, Journal of Meteorology, 2005

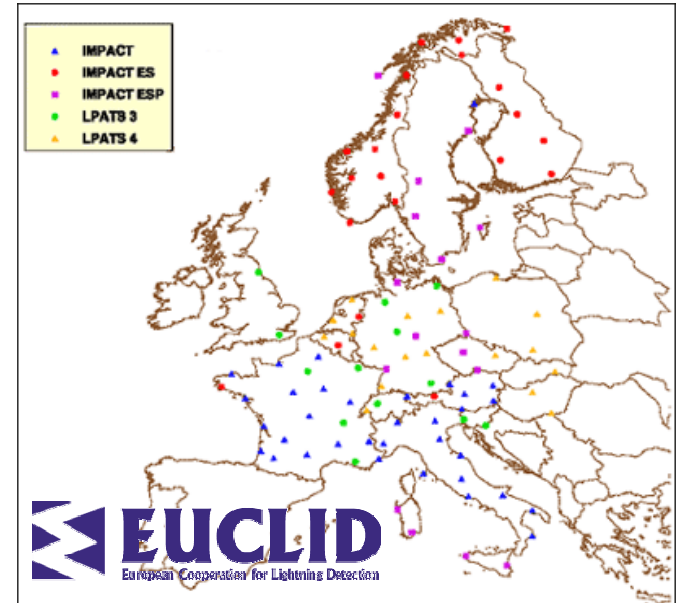
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## 6. Project aims, COST call of interest

6.1 Development of European BL research  
along a **north-south axis** (Scandinavia-  
Austria/Germany-Italy), regional analysis

6.2 **BL GIS data bank**, EUCLID/climate/  
geological/hydrological spatial correlations

6.3 **BL „hot spots“** for instrumental records



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**Thank you for your interest !**

*The Austrian ball lightning group*

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