Tourism as Example of Rural Innovation in Austria

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Structure of Presentation

- Part 1: Rural Tourism
- Part 2: Winter and Snow Based Tourism

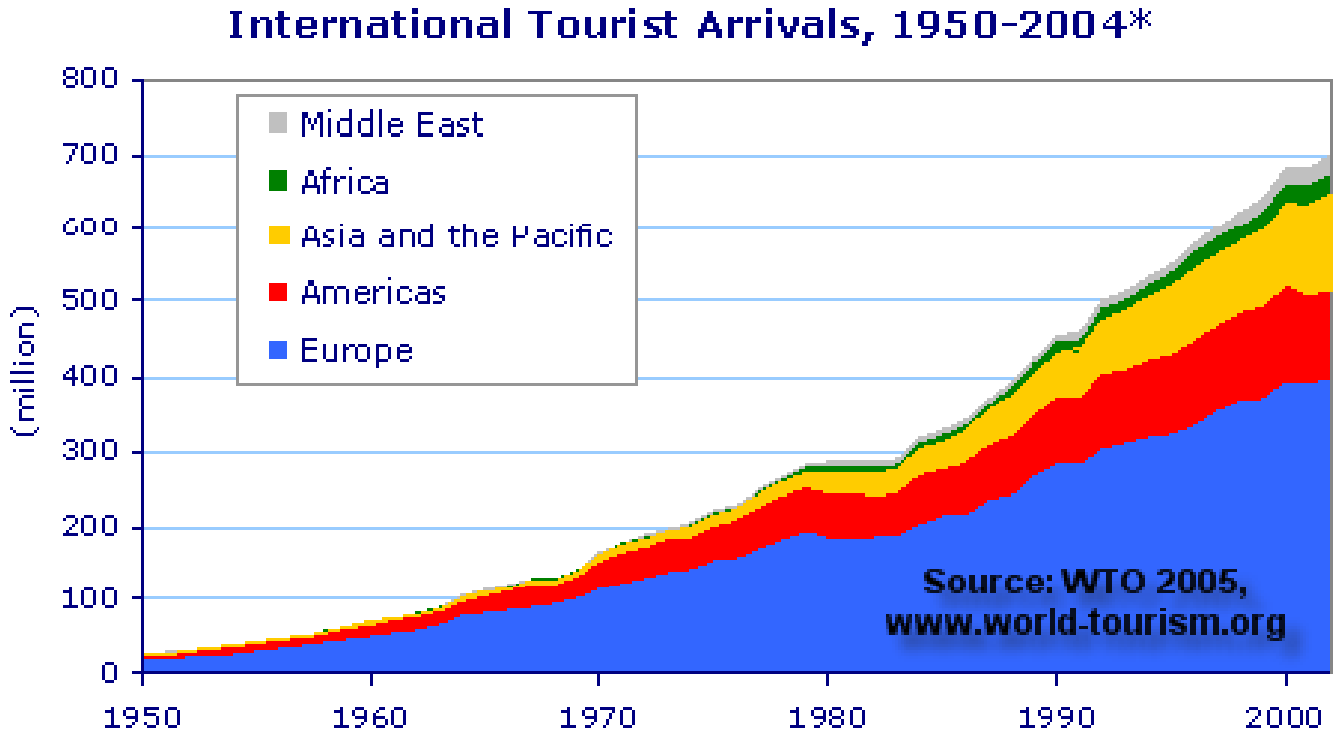
PART 1: What is Rural Tourism?

What is Tourism?

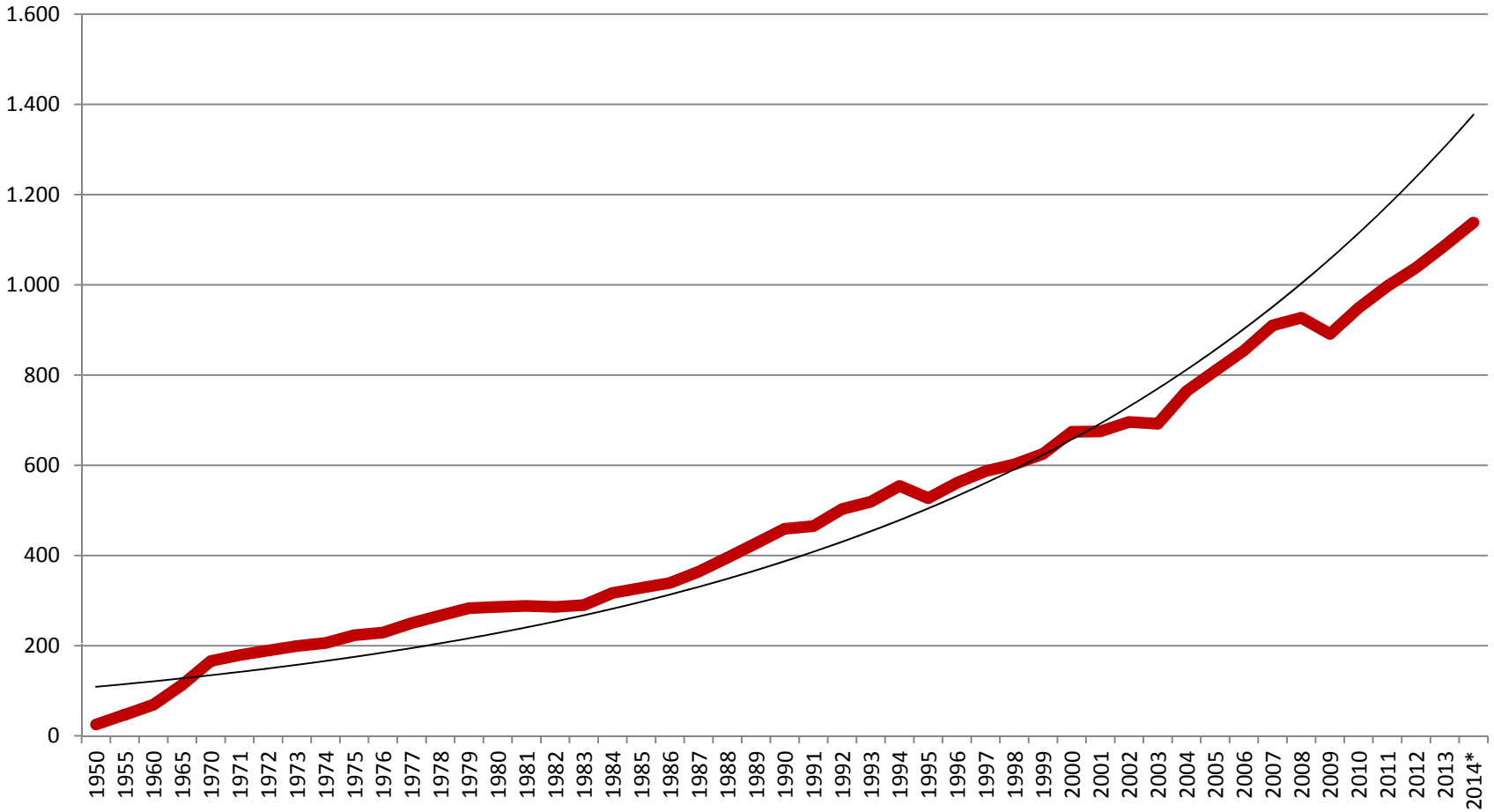
- persons travelling to and staying in places outside their usual environment
- A trip for
  - Vacation,
  - Relaxation,
  - Cultural learning or
  - Amusement,
  - Contrasting everyday life
- No trips for
  - business
  - visiting relatives
- Practical division of trips
  - Difficult, as often mixed forms
  - Austria considers all trips from 4 days with overnight stays as tourism
  - Maximum of one year staying abroad

What More is Tourism?

- One of fastest growing branches in world economy
- A service bought by
  - Consumers or Tourists
- A service provided by
  - Sellers of tourism

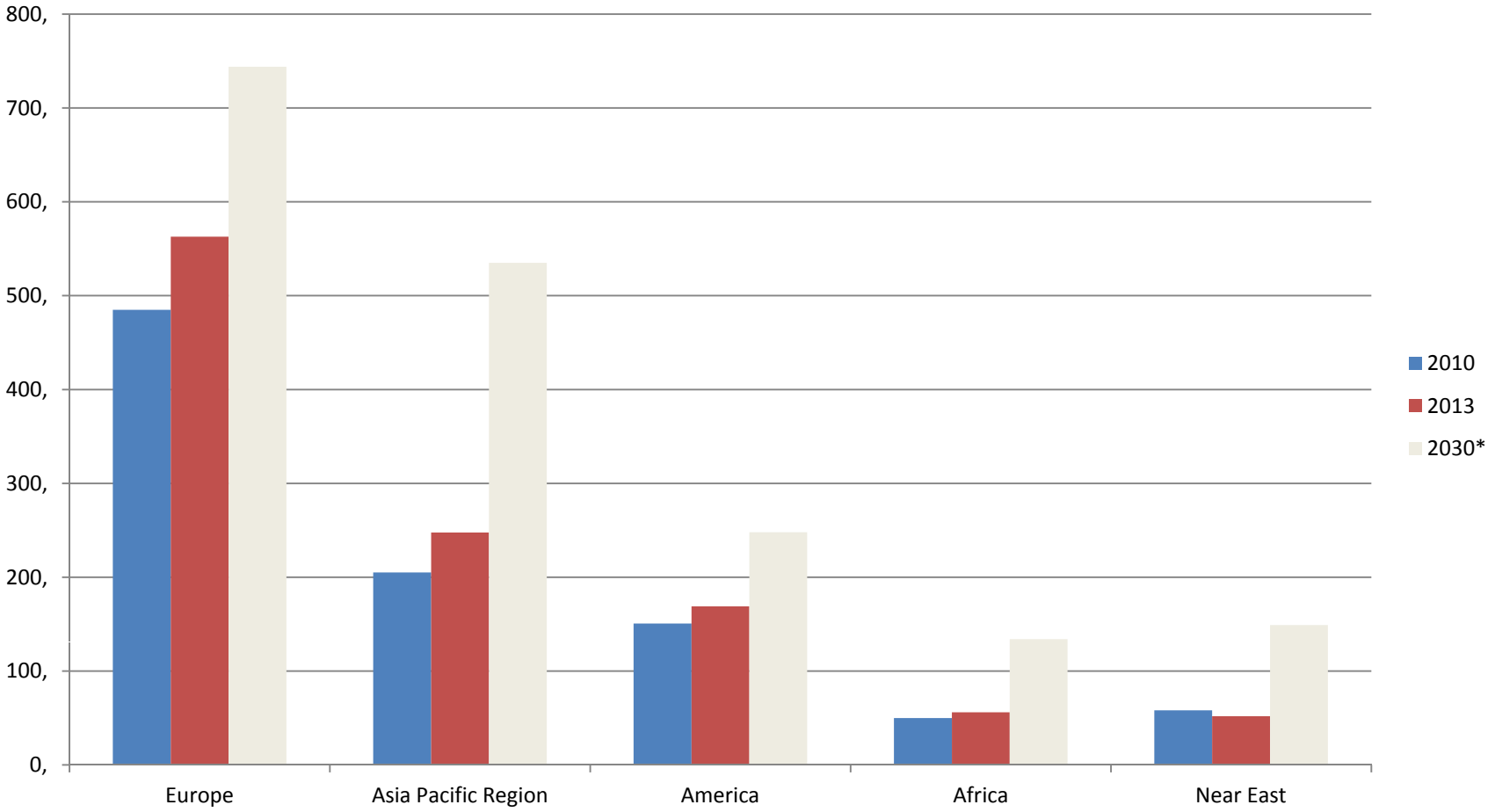


International Tourist Arrivals Worldwide in Million Arrivals 1950 to 2014



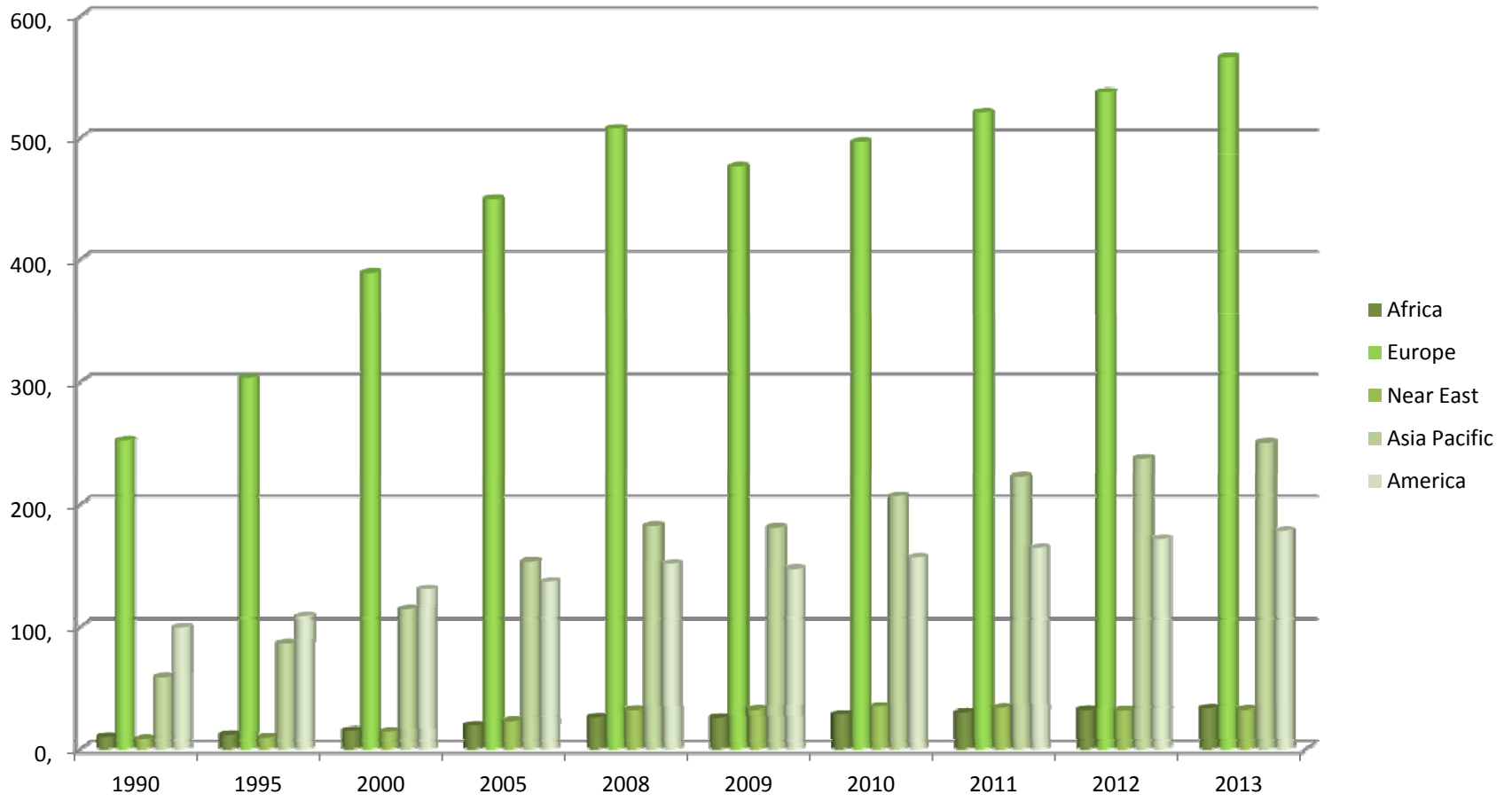
UNWTO World Tourism Barometer , January 2015

Trends in International Tourist Arrivals in Millions According to World Regions



Source: UNWTO, March 2014

International Arrivals in Outbound Tourism in Million Originating from Region



Spatial Relevance of Consuming Tourism

- International Tourism
  - divided into
    - outbound tourism
    - inbound tourism
- National Tourism
  - can be divided in larger countries into
    - Domestic tourism
      - E.g. all tourism within a country, Austria, Indonesia, etc.
      - http://www.austria.info/us
    - Regional tourism
      - E.g. tourism within one national region, e.g. Tyrol
      - http://www.tirolwerbung.at

Spatial Relevance of Selling Tourism

- Individual sellers are organized (non organized) in
  - resorts, regions or destinations
  - Use a national tourist internet platform like:
  - http://www.tiscover.com/at/guide/5,en/objectId,RGN6at,modulId,home/home.html

Seasonality of Tourism

- In Austria and Romania (selling tourism)
  - Winter tourism (Nov. to April)
    - A kind of rural tourism based on skiing and snow
  - Summer tourism (May to October)
- For individual tourists
  - Holiday seasons
    - Christmas, Easter, Summer in Austria/Europe
  - Non holiday season all other times
    - Restricted to retired people, perhaps students, ….

Division of Tourism into „Urban“ and „Rural“

- Each region can be considered as (potential) tourist region
  - Divided into more and less populated zones
  - Or into urban and rural sub-regions as compared to the main region
- Urban tourism is connected to major cities and urban infrastructure
  - E.g. in Austria to Vienna, Salzburg, Innsbruck

Urban Tourism

- Centres give best access to travel
  - Major tourist infrastructures are situated here
    - like airports, railroads, highways connecting city centers
    - At the beginning tourism is urban
  - Urban culture as a main attractions
    - Theatres, concert halls, museums, parks and gardens
    - Large variations because of many people with various cultural preferences

Rural Tourism

- Is in general tourism of smaller scale, often difficult to access
  - Recreation, relaxation is main motive
  - Regional contrast to urban life for nearby cities
  - Is not expected to grow very fast
  - Comes after urban adventure for international tourists (if at all)
- Landscape is in focus as basis for any kind of rural tourism
  - Non designed agricultural or forestry landscape
    - Predominance or high percentage of farms and farming
  - Particular regional characteristics that can be found many times within the region, but not outside

Kinds of Rural Tourism

- All non urban tourism is rural
- Differentiation in “Special” and “Non-special”
  - Special Rural Tourism
    - Outstanding tourist sites of high density tourism (mass tourism)
      - » Großglockner Hochalpenstraße during opening (June to September)
      - » Lech Arlberg (winter)
      - » Kitzbühl (winter)
      - » National parks
    - Major tourist spots
      - » Developed urban structures because of attractiveness of tourism
      - » Expectation of further growth or at least continuation

Non-Special Rural Tourism

- Two Categories
  - Specialised Rural Tourism
    - Undertaken by specialized tourist companies
      - Hotels, restaurants on country side
      - Owners/Operators of small museums
      - Ski lift operators (in summer lifts to access higher altitudes for hiking)
      - Wind surfing, swimming and diving schools near lakes
      - Etc.
  - Farm Tourism
    - Recently popular all over Europe
    - In Austria 14,000 farms offer farm tourism
      - Non specialized in tourism
      - Tourism a part of (agricultural) income
      - Maximum to accommodate people without licence is 10
      - In average 12 beds per farm
    - There can be negative sides in particular for sellers of rural tourism
      - Family unfriendly due to working hours
      - Seasonal peaks and long periods without work
      - Not too prestigious to work in tourism

PART 2: Experience from Austria

Austria

- Source of map: travel.yahoo.com

The Austrian rural landscape

- Is the basis for rural tourism

Non special rural tourism

- Unique qualities that can be found in all rural landscapes

Students exploring rural Austria

Renaturation of creek in rural landscape

- In Austria special programs to improve environment of villages (Dorferneuerung)

Combined with flood protection

- River renaturation both in connection with aesthetics and flood protection

Appropriate signing to attract tourists

- Local products are sold
- The village museum is indicated

Tourism makes use of cultural heritage

- Most of the attractions are already in the landscape
- Here there are Roman excavations reassigned as tourist attraction

Open Air Lecture

- Local people explain interesting details to tourists
- Understanding of wider details become possible

Farmers in Rural Tourism

- Without farmers no rural tourism
- Farmers maintain landscape for tourism
  - play since long important role in rural tourism
  - Provided the basis for tourism in Austria
- In Austria more income generated by tourism 5.8% as compared to agriculture 1.3%
  - Considered when other economic activities do not go well in 50ies
  - Particular in mountainous region of Austria

Example Farmtourism

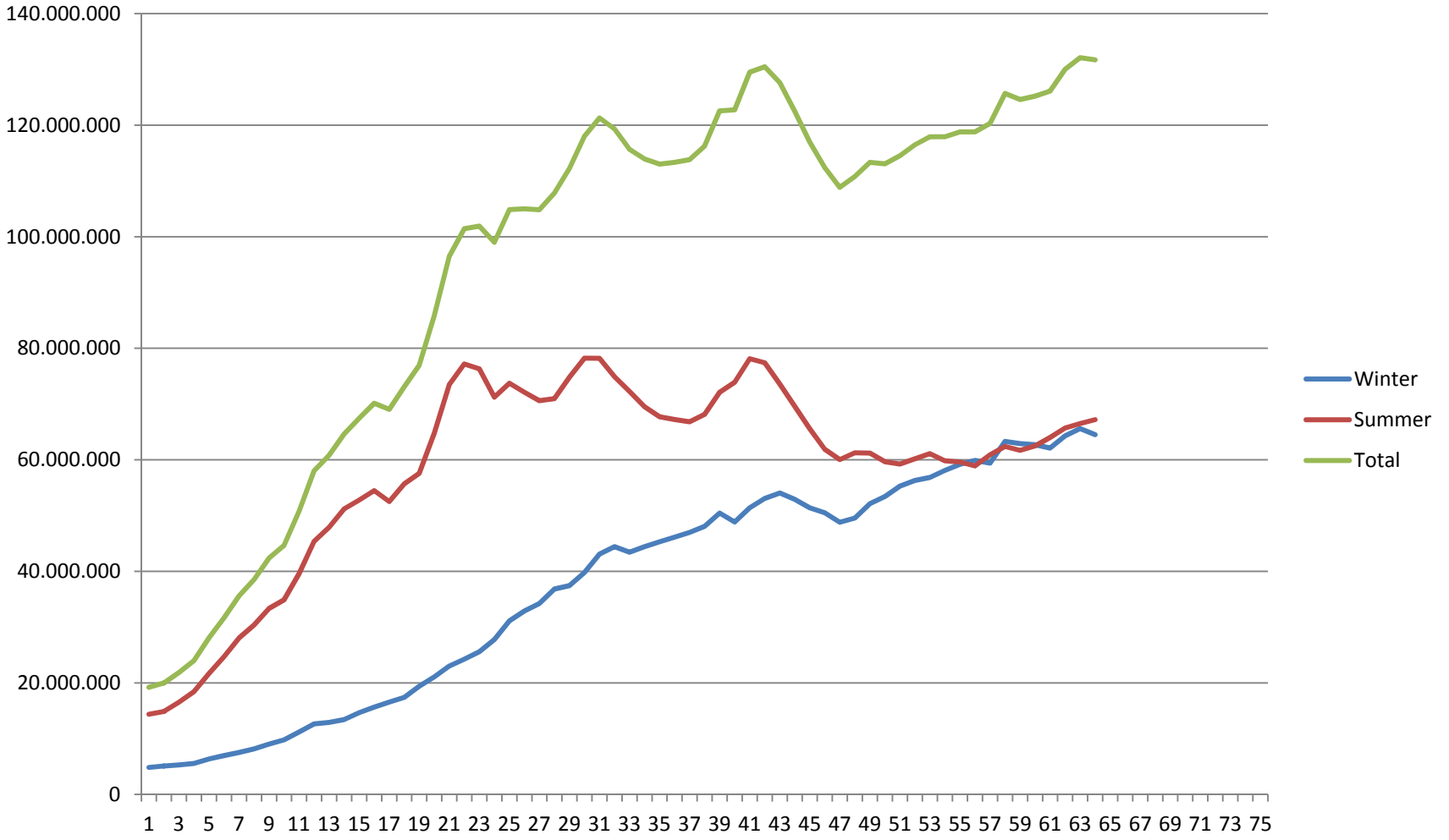
- Farm tourism
  - offers one seventh of Austrian tourist beds (140,000)
  - Is small scaled and close to a “home stay”
    - Moderate prices, about € 30 for one overnight stay
    - Some € 30,000 turnover per farm and year due to tourism
  - www.farmholidays.com
    - “Trademark” of over 20% of all farms offering tourism
    - Divided into 8 provinces with regional characteristics
      - Common website and Online booking
      - Some 25% higher income than other farms offering farmholidays
    - Offer specialisation for members
      - Organic farming cuisine
      - Children farms
      - Riding farms
      - Wine farms
      - Disabled persons farms
      - Other programs

Example Eco-Tourism

- Until 1980s called “Soft Tourism” (Sanfter Tourismus)
  - Soft tourism was a concept for remote areas
    - Intensive development was not possible
      - Other regions developed earlier and same tourist development was impossible
    - Use of existing (infra-) structure without major external developments
      - Often a cheap tourism and revenues were not too high
      - Local sellers did not like it
  - Eco-tourism (re-) gained popularity after UNCED
    - international discussion
      - Better possibilities to get funding due to Local Agenda 21 projects
      - Avoiding of marketing as cheap low investment tourism for particular regions as a contrast to richer neighbours
      - another way of selling farm tourism
        - » In particular tourism on organic farms
      - Or other rural tourism
        - » Visits in National Parks

Part 2: Winter and Snow Based Tourism

Growth of Austrian Tourism 1951 -2014



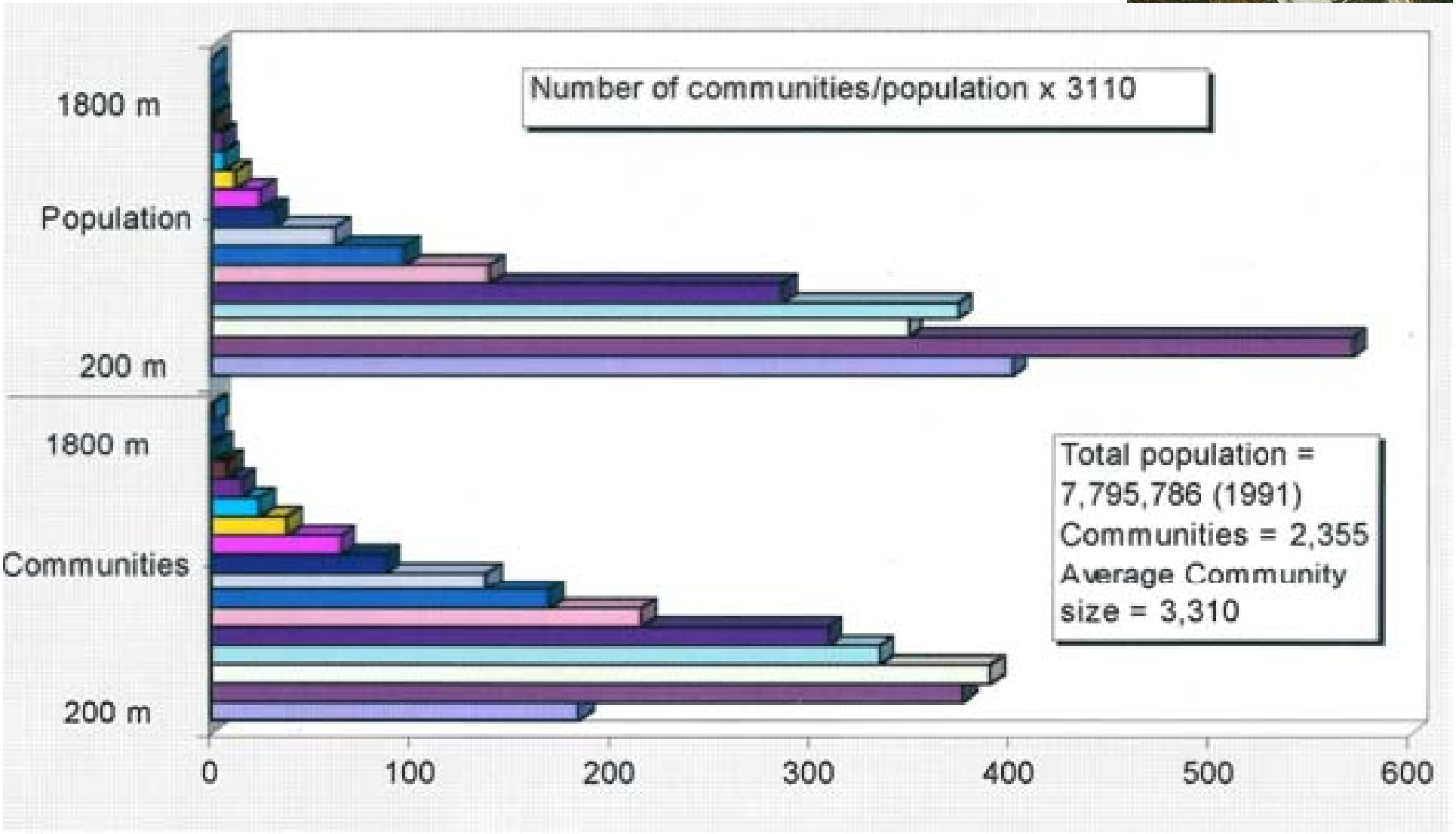
Of successful growth in tourism

Restaurants create added value

Austrian tourism in numbers

- 1951 in total 20 million guestnights
  - 5 million during winter
  - 15 million during summer
- 1976 totally 105 million guestnights
  - 33 million in winter
  - 72 million in summer
- 2001 with 115 million guestnights
  - 55 million in winter
  - 59 million in summer
- 2007 with 121 million guestnights
  - 59 million in winter
  - 61 million in summer
- 2013 with 131 million guestnights
  - 65 million in winter
  - 66 million in summer

Particular Role of Altitude



Trends in Austrian Wintertourism

- Still growing during the last years
- Strong dependence on snow
  - There is no direct correlation guestnights – snow
  - But there is a crosscorrelation guestnights - snow
- Snowcover increasingly more as a result of manmade snow
- Renewal and capacity increase of skilifts is another reason for successful winter tourism
- Costs for infrastructure development increase
  - 500 million € are annually invested into improvements of some 250 resorts
- Structure of winter tourism is changing
  - More international tourists
  - Less Austrian skiers
    - Skiing rate of population is 35% in Austria
      - Expected to decrease

Critical for successful winter tourism: to have snow

Crucial to have snow: devices for artificial snow making

Technical means of adaptation to shrinking snow area: increase capacities

Technical means of adaptation: to fit ski slopes to slope preparation machines

If things become technical there is a role for Innovators

WORLD SNOW FORUM 2013
www.worldsnowforum.org

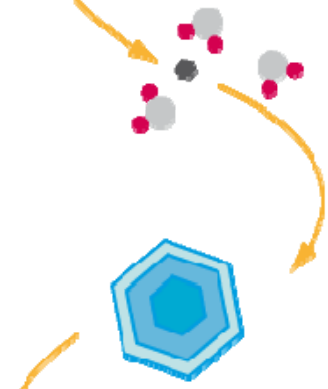
International and interdisciplinary research team: more than 30 people worked on the development within the last 3 years

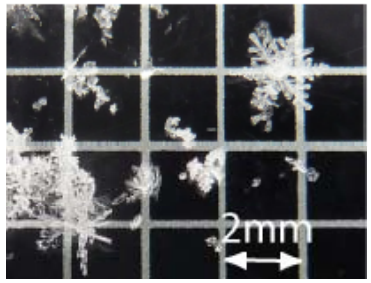
Environmental Aspects: Resource Savings

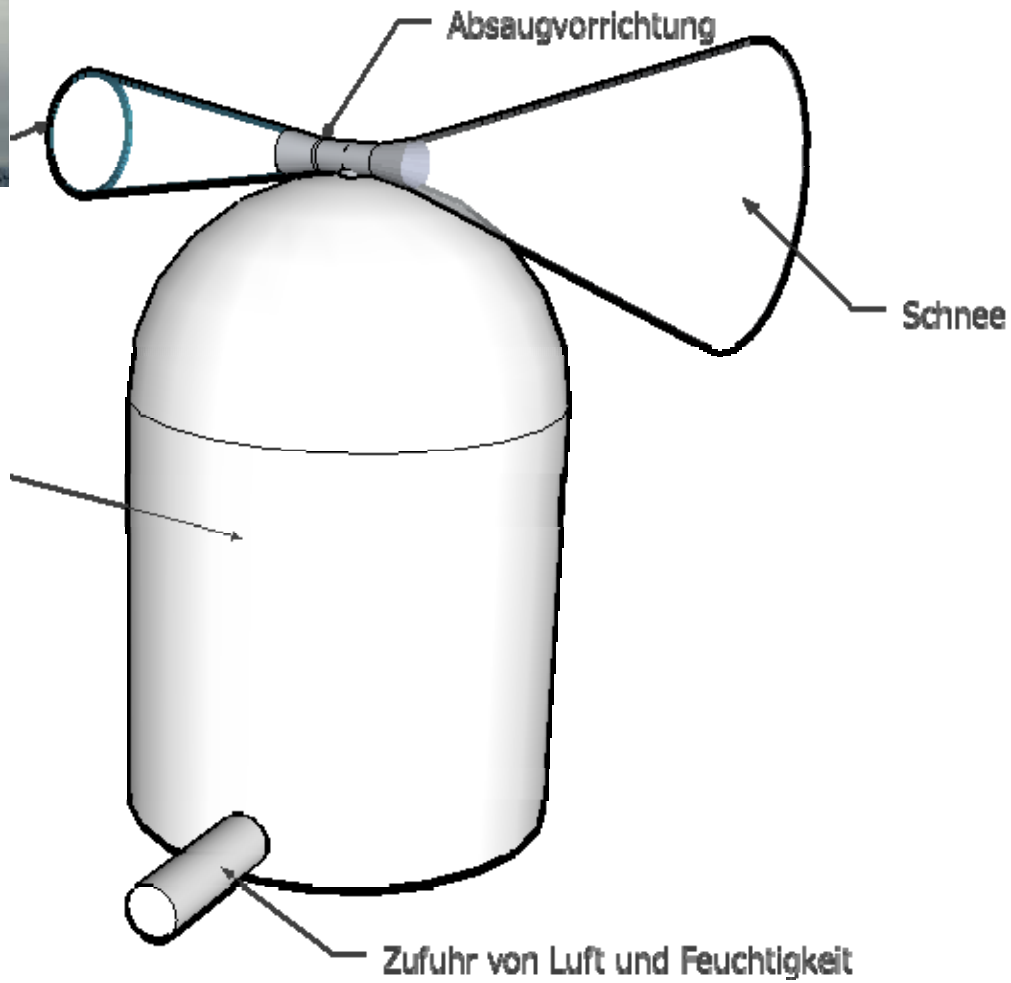
Water Saving for Snow Making

And Accompanied Energy Savings

Principle of the Artificial Cloud

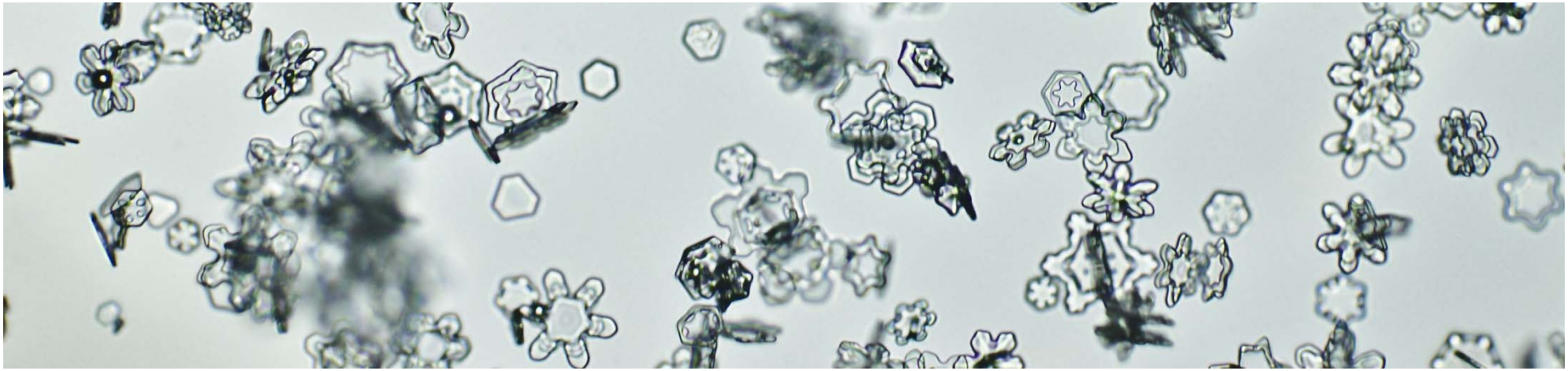






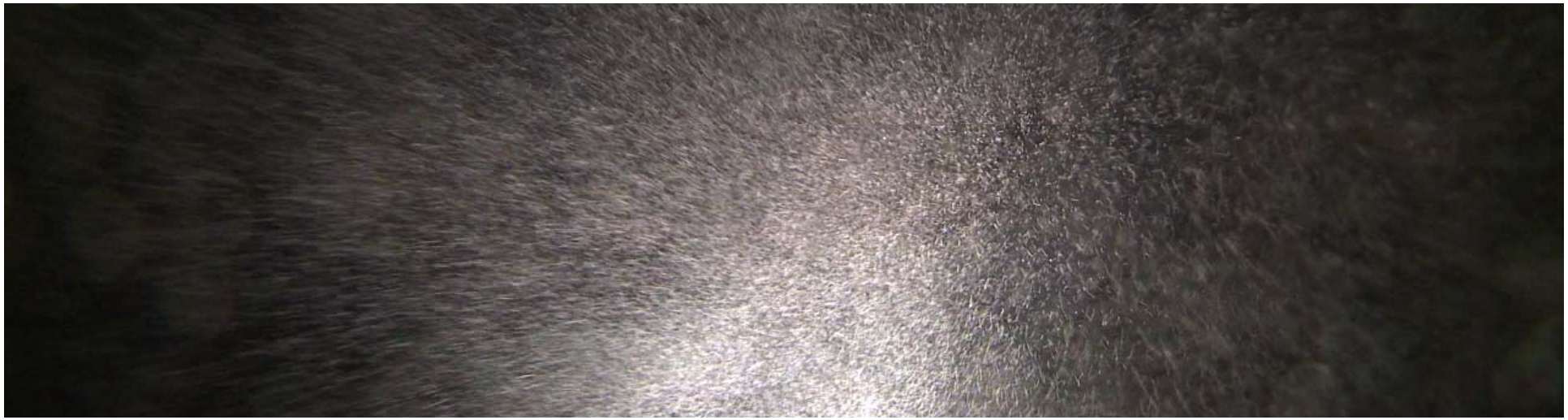
Principle of Artificial Cloud

- Provision of ice nuclei
- Feeding the ice nuclei with humidity
  - Growth depends mainly on temperature and available water vapor (cyclic or continous)
  - Time in chamber defines the snow properties
- Transport of produced snow into the environment



Output of the artificial cloud

- Snowdensity < 250kg/m^3 (in our trials between 90 and 210kg/m^3)
  - Decisive for kind of application
- We can save water
  - The production method in a container is fundamentally different from the method we find today
  - Up to 30% of water savings are theoretically possible
- We can reduce energy usage
  - Equivalent to % in water saving
  - Plus energy savings due to less pressure to transport water
- Without cooling
  - we can snow at higher temperatures than conventional machines (-1°C > T > -5°C)



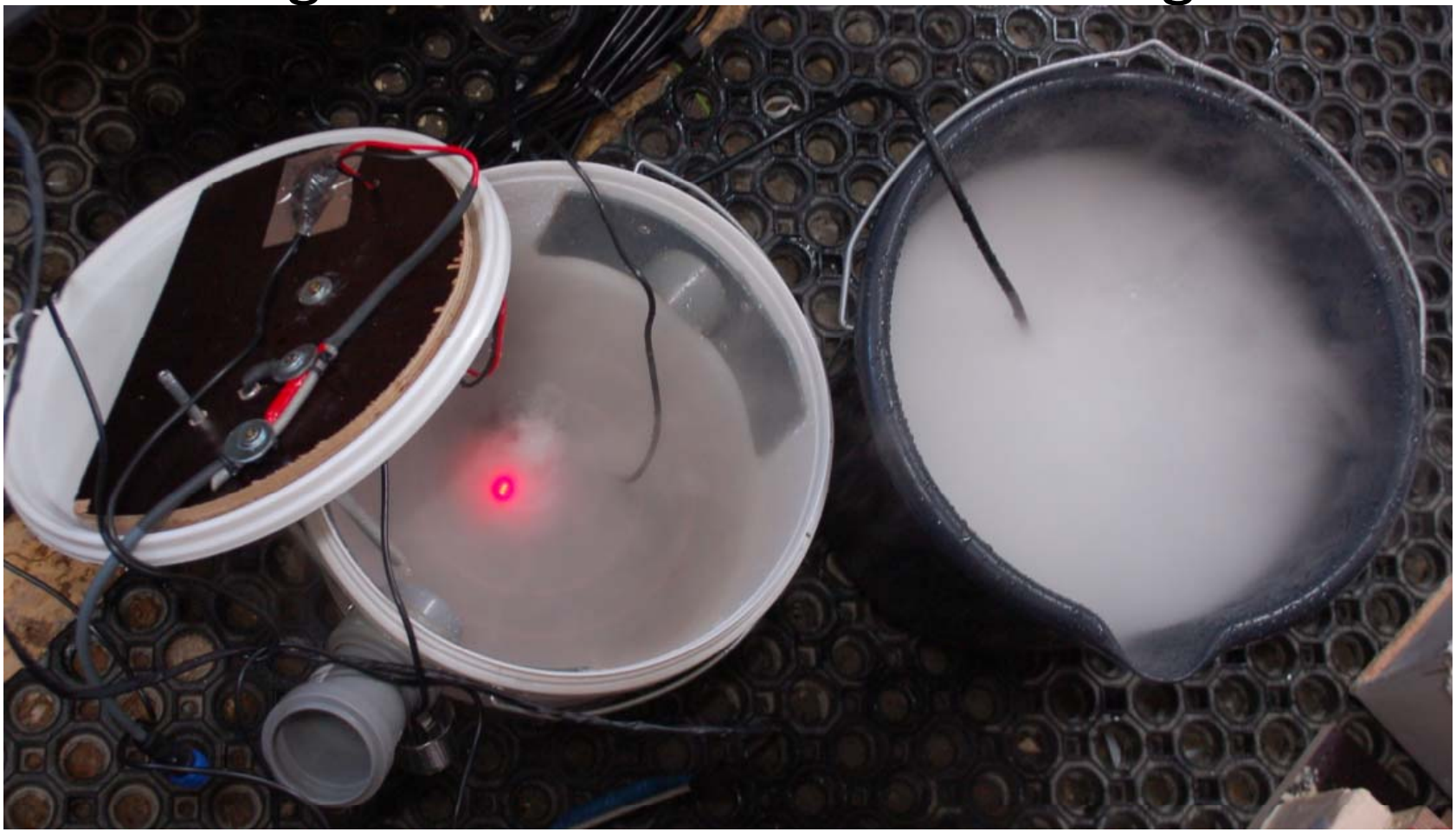
Laboratory Experiments

A Cool Job for Researchers

Team of Experts Undertaking Field Experiments

..sometimes fingers get stiff

High Tech For Better Water Usage

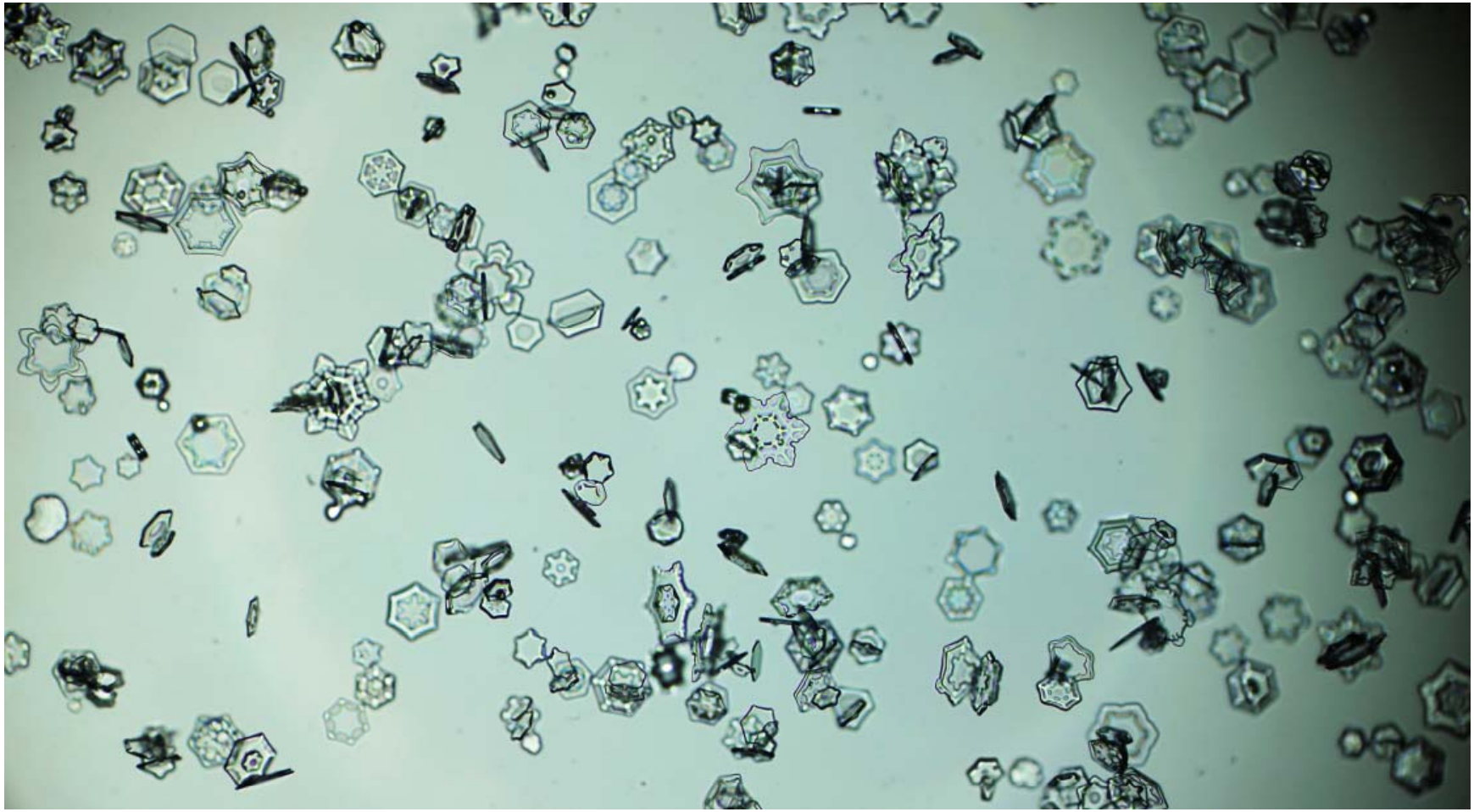


Water Tube in Outdoor Laboratory

Measurement instruments & data collection

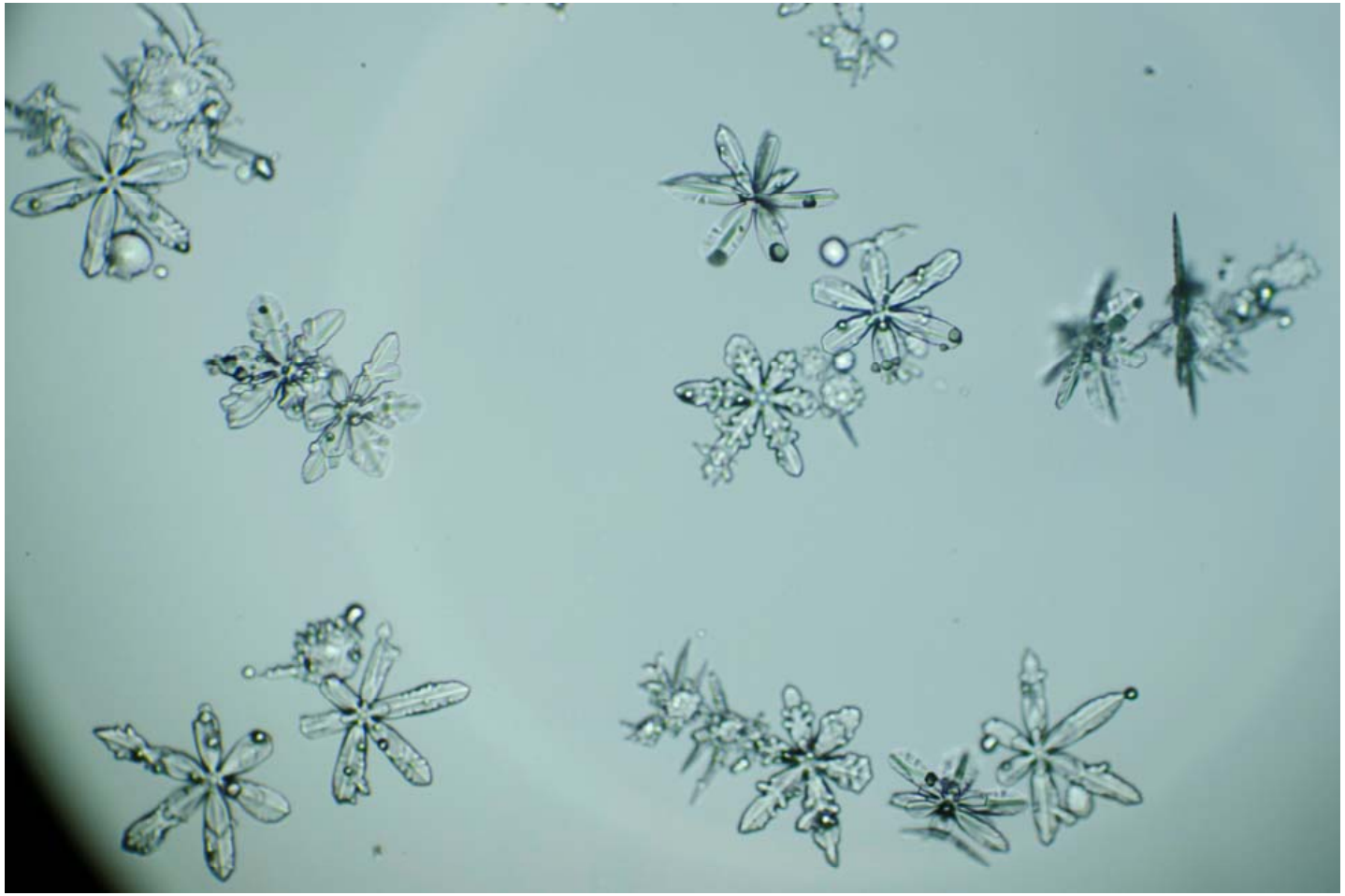
Quality Control of Produced Snow under Microscope

Snow Crystals

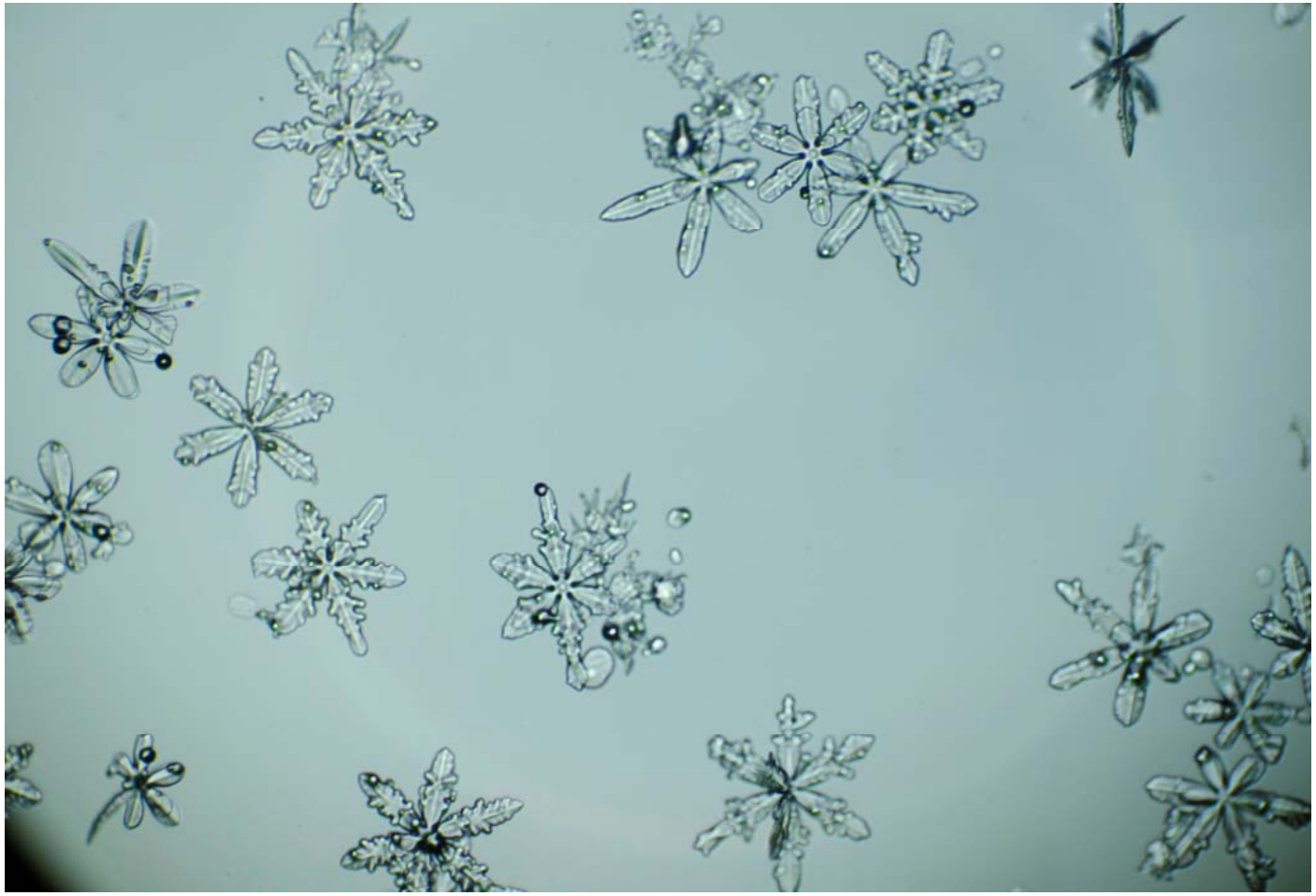


Snow Crystals (1)

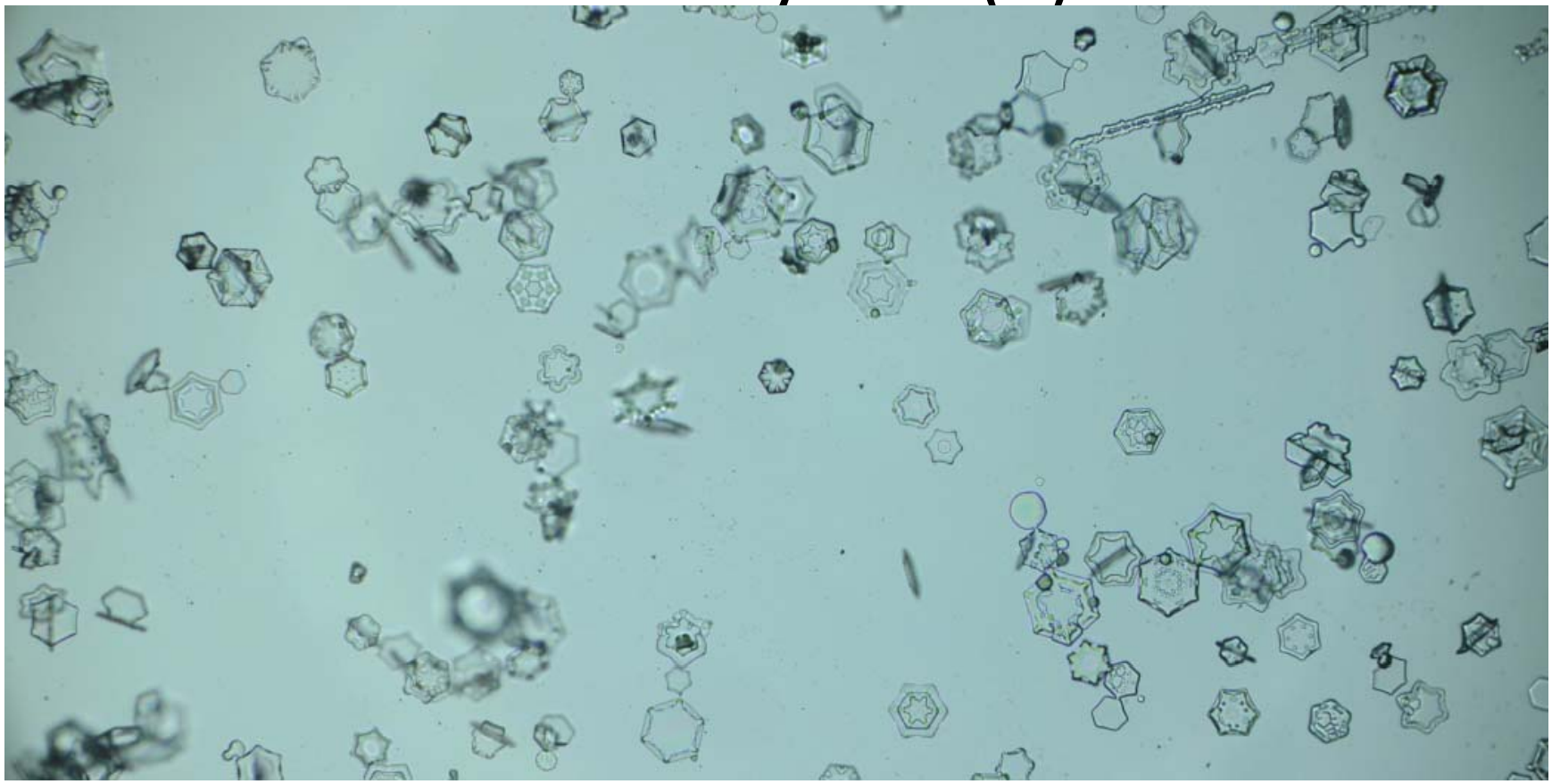
Snow Crystals (2)



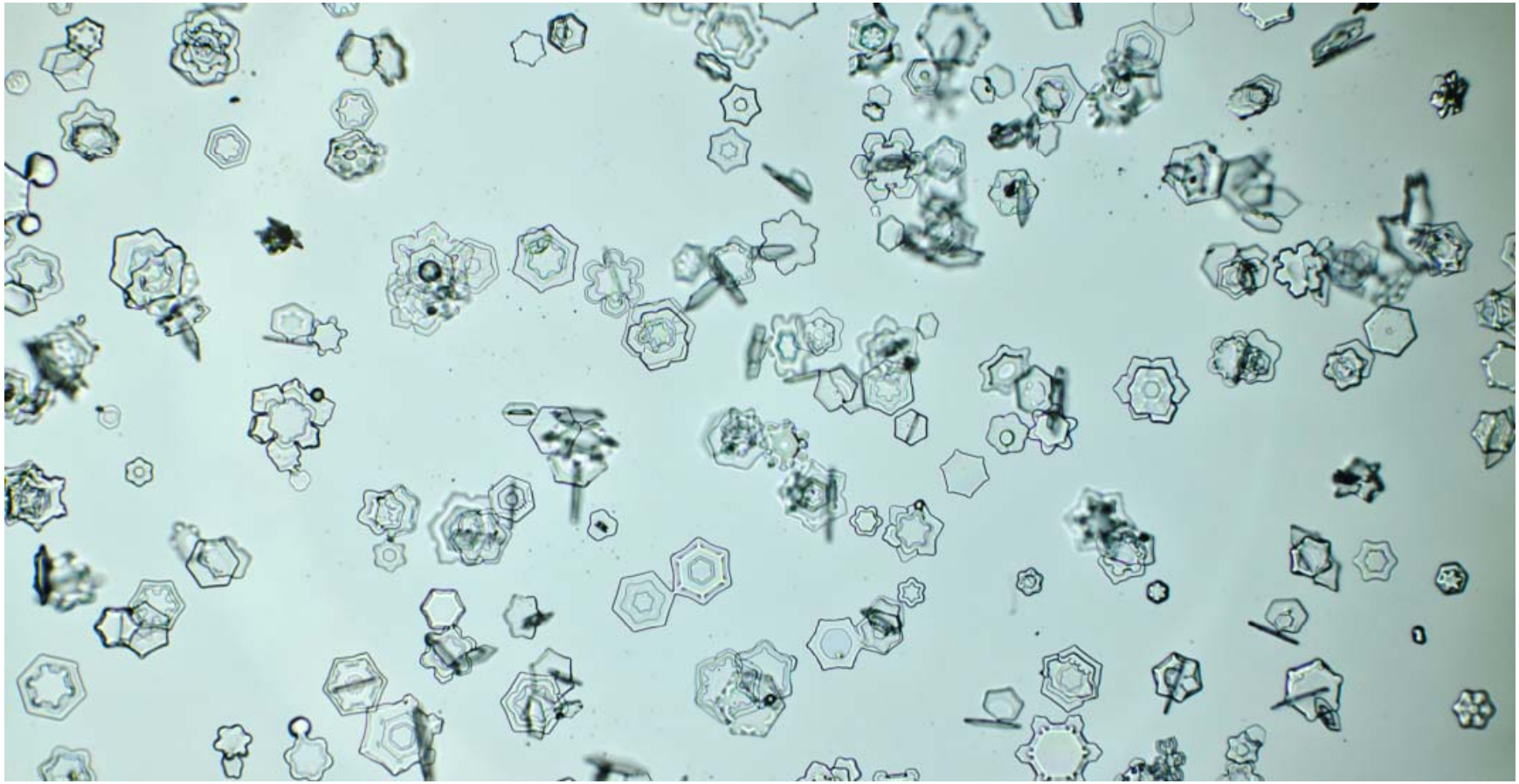
Snow Crystals (3)



Snow Crystals (4)



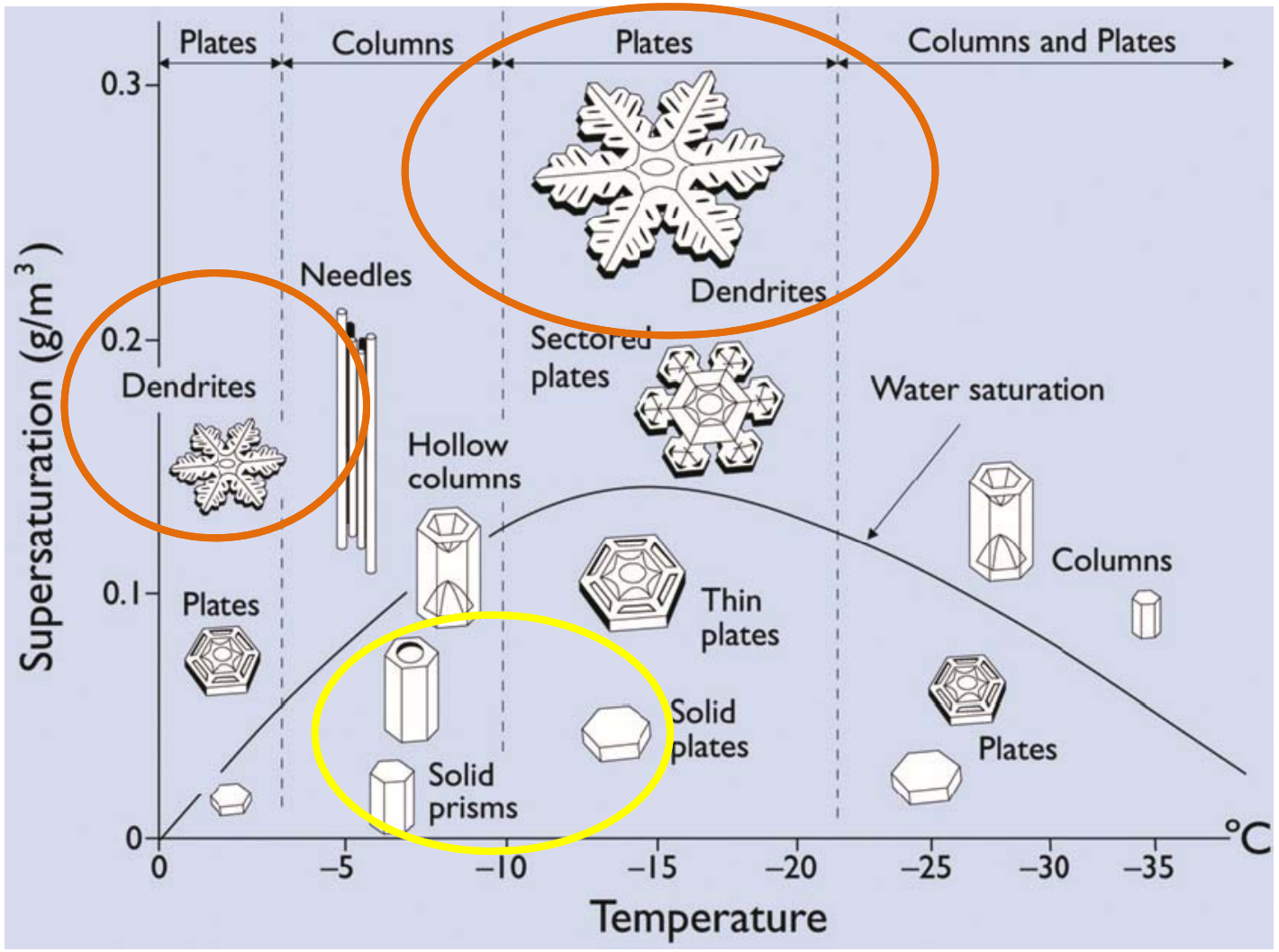
Relation Between Shapes of Snow Crystals



Measurement of Snow Properties

Snow at the Bottom

Snow genesis: Nakaya Diagram



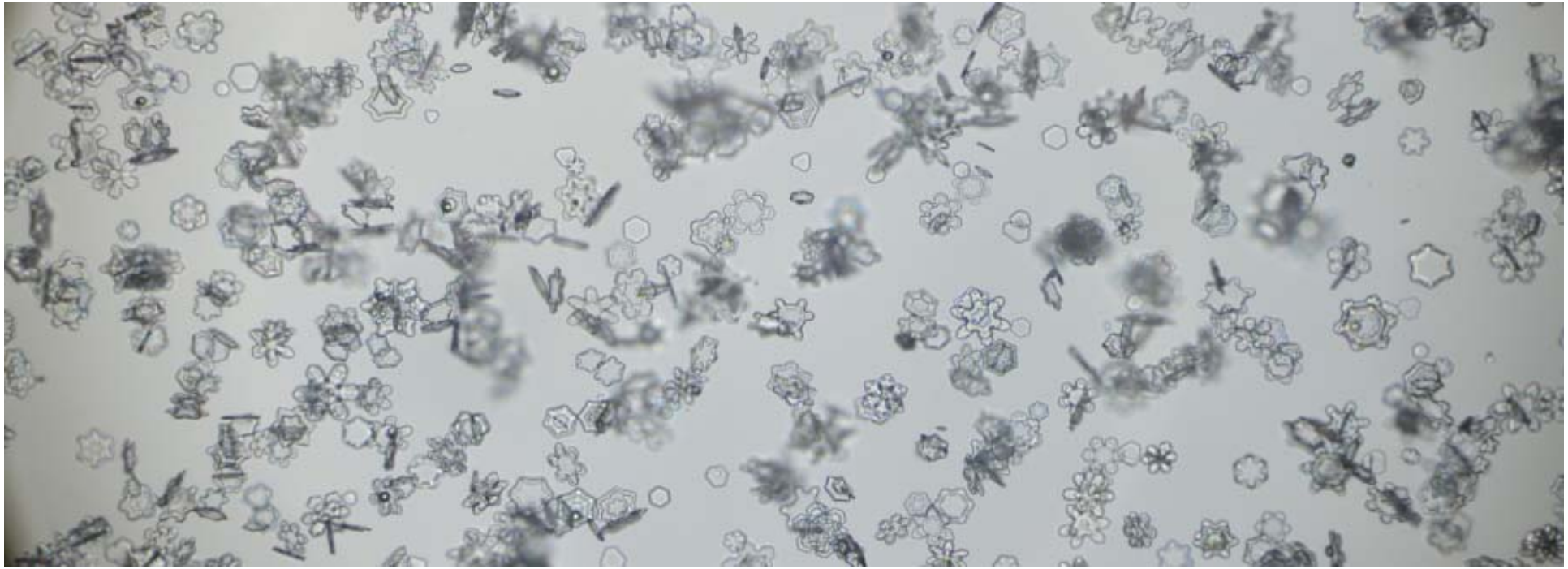
Source: Libbrecht (2005) after Nakaya (1954)

Snow metamorphosis

- Cold environment temperature
  - Snow flakes fall on frozen ground
  - Snow flakes cumulate to a snow layer
  - The first snow layer get a second snow layer with next precipitation
  - A snow cover blanket accumulates to tens or even hundreds of snow layers
- Mixed cold and warm environment temperature
  - In particular the top of the snow cover melts and freezes
  - The volume of air reduces in snow cover
  - The more often this process is going on, the less air we find in the snow cover blanket
  - Finally the snow cover can become ice
- The specific weight per cubic meter changes
  - Starting from as light as 40kg/m^3
  - Ending up with 900kg/m^3 and in form of ice
  - Ending up with 1000kg/m^3 and in form of water

DG snow is nature identical snow

- Snow is a mixture of different states of water:
  - ice, water and air
- DG snow has considerably more air included
  - Just as if fallen from the sky
- Temperature, humidity, wind speed
  - define the shape of the snow flakes

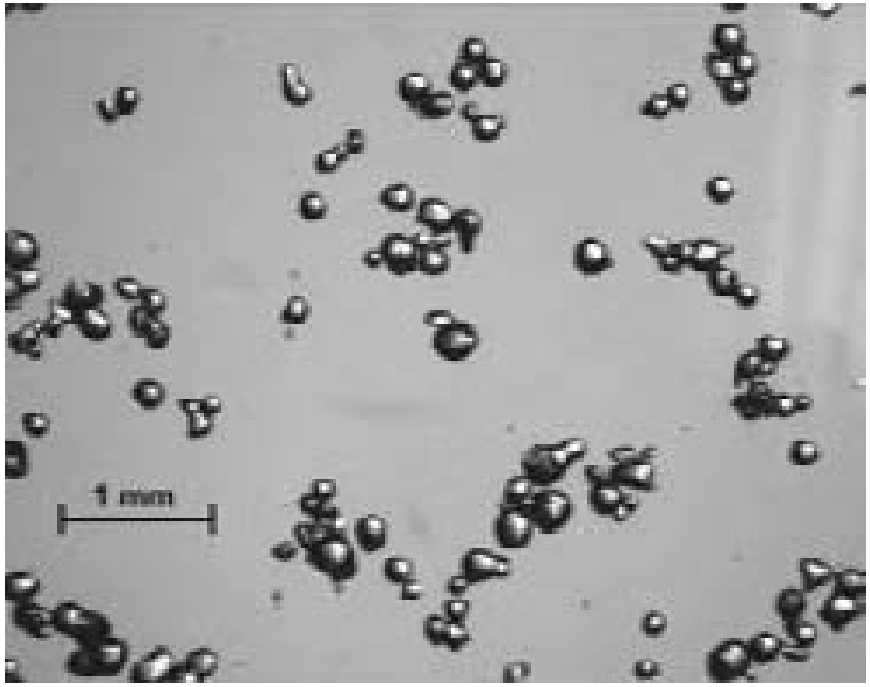


The product: nature identical snow

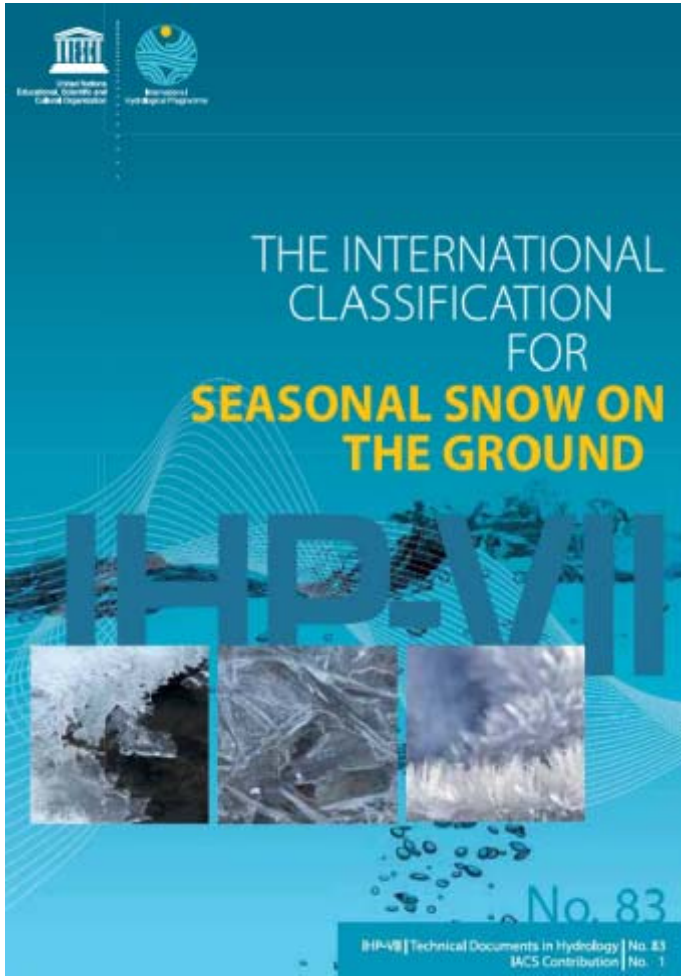
- Natural snow crystals are unique and grow on hexagonal basis to needles, prismas and dendrites.
- Dry snow with hexagonal dendrites = Powder snow (light fluffy snow)
  - Can also vary from 40kg to 150kg/m³ depending on crystals forming it
- Stands at the beginning of the snow metamorphosis

Difference to current state of the art

- Conventional manmade snow is in between: very little air and 380kg to 500kg/m³,
  - Higher shares in ice and water
  - Lower share in air
  - Equivalent to old and settled snow cover
  - Intermediate state between powder snow and ice



Source: M. Fauve, H. Rhyner, und M. Schneebeli. 2002

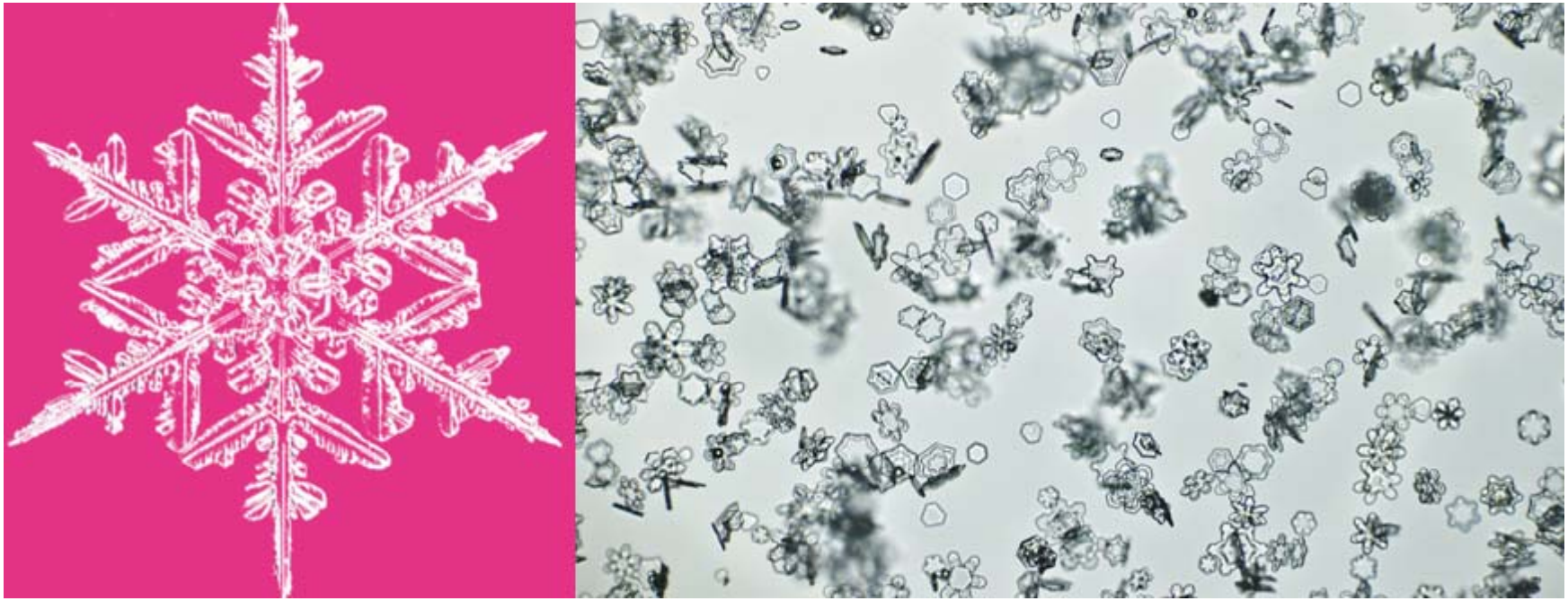


Source: http://unesdoc.unesco.org/images/0018/001864/186462e.pdf

The UNESCO SNOW Classification

- Physical Properties
  - Microstructure
  - Cornform
  - Size of corn
  - Snow density
  - Snow hardness
  - Water content of snow
  - Snow temperature
  - Impurifications in snow
  - Snow cover depth

A different product



- Different densities: in lab from 90kg to 210kg/m^3
- Deep snow ski runs can be planned independently from weather
- More safety on ski runs

New touristic products become
feasible for ski areas

Powder Snow Tracks

Foto: M. Breiling, Nov. 2011

Free Style Snow Park

Foto: M. Breiling, March 2012