National Aerospace University
named by N.E. Zhukovsky
«Kharkov aviation institute»

Aerodynamics Department

"Scientific Potential of National Aerospace University "Kharkov Aviation Institute" in aerodynamic researches"

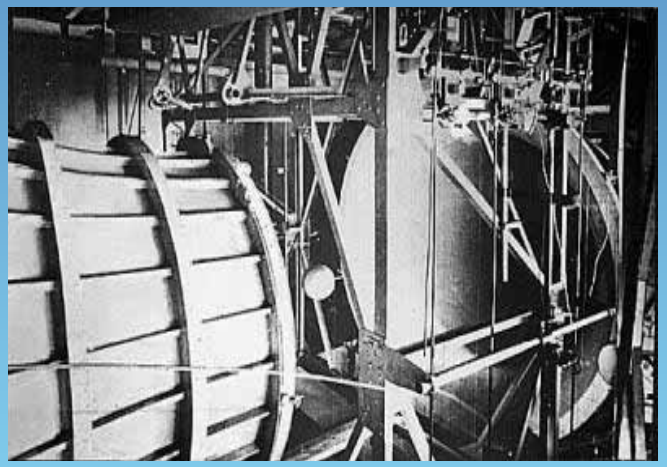
Vitaly Chmovzh

Head of the Aerodynamics Department

Aerodynamics Department

- Founded 1930
- Founder - ***Georgy Proskura***, successor of N. E. Zhukovsky

T-1 - first wind tunnel in Ukraine (1915)



Team of Researchers

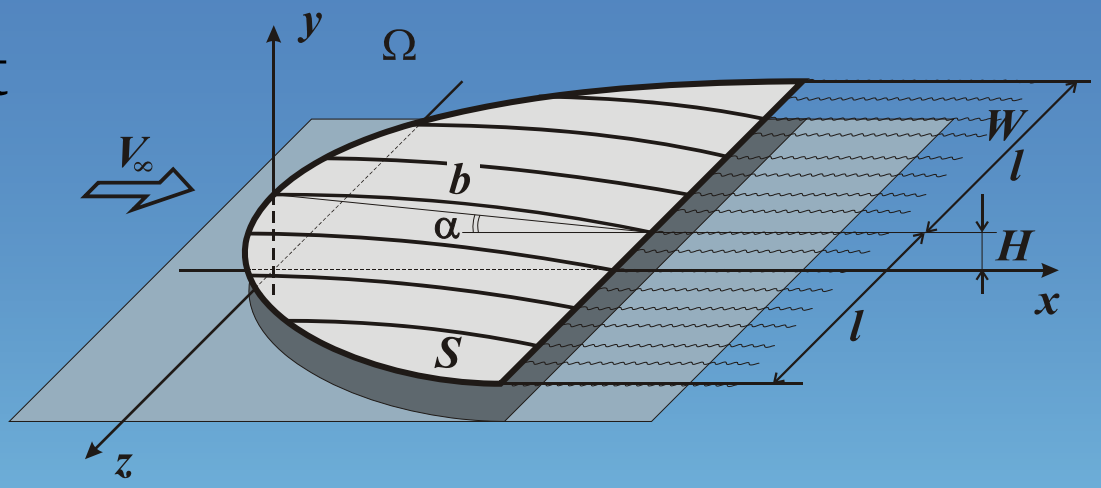
- 6 Ph.D., 6 graduate students
- 2 professors, 4 associate professors
- 24 research engineers
- 20 engineers

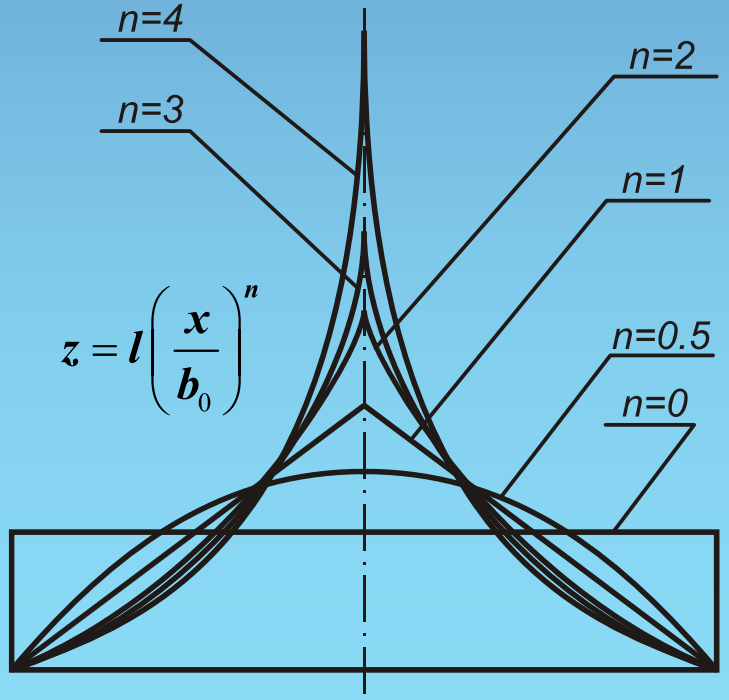
Research Laboratories

- **low speed aerodynamics**
- **high speed aerodynamics**
- **aero-acoustics**

Fundamental research

- Wing in Ground Effect Aerodynamics
- Adaptive Airfoil
- Coanda Effect
- Boundary Layer
- Jet-Controlled High-Lift Devices
- Wing and Fuselage Integration
- Semi-empirical Method





Experimental research

- Aircraft of Various Configuration
  partners: TsAGI, Tupolev Design Bureau, Ilyushin Design Bureau, Antonov Design Bureau

- Wing-In-Ground Effect Craft, Amphibious Aircraft
  partners: Beriev Design Bureau

- Ground Vehicle, High Speed Surface Transport
  parthers: Department of Transport of USSR, RAF, “AvtoKrAZ” holdihg, “AvtoZAZ”, Transport Academy of Sciences of Ukraine

Experimental research

- Helicopter of Various Configuration

- UAV of Various Configuration in Wide Range of Mach Number

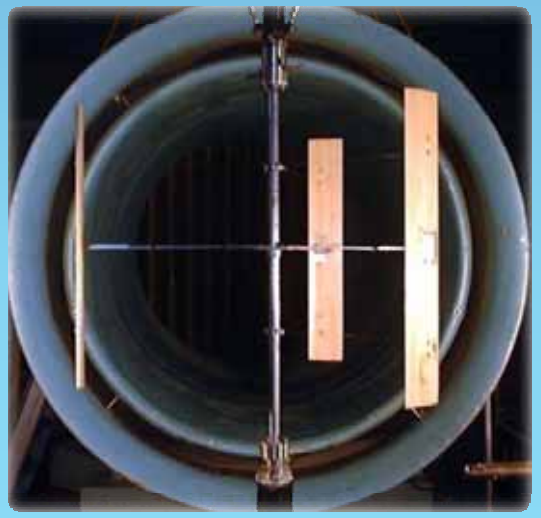
  partners: Design Bureau “Luch”, “Yuzhnoye” Design Bureau

- Airfoils, Models of Wings and High-Lift Devices

Low Speed Wind Tunnel T-3

WT DESIGNATION	**T-3**
Test Section (m)	∅1.5 m
Length of Test Section	2.14 m
Max. Flow Velocity	45 m/s
Typical Value of Turbulence Intensity	0.65%
Balances	6-component

- Scale Model of VAWT in Working Section of Wind Tunnel ***T-3***



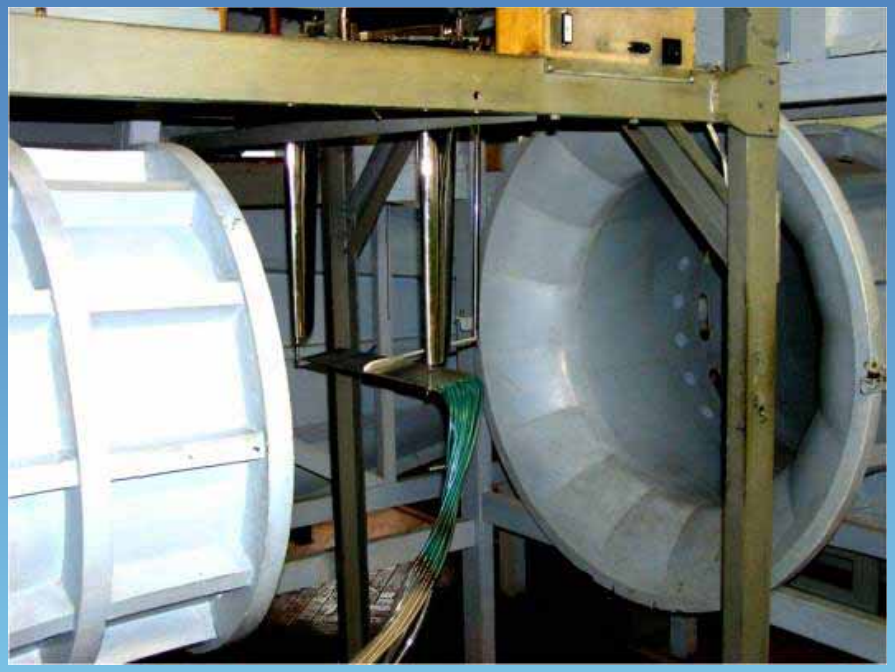
Low Speed Wind Tunnel T-4

WT DESIGNATION	**T-4**
Test Section (m)	∅1.5 m
Length of Test Section	2.10 m
Max. Flow Velocity	60 m/s
Typical Value of Turbulence Intensity	0.75%
Balances	6-component

- Scale Model of UAV in Working Section of Wind Tunnel ***T-4***

Low Speed Wind Tunnel T-5

WT DESIGNATION	**T-5**
Test Section (m)	∅0.75 m
Length of Test Section	1.5 m
Max. Flow Velocity	40 m/s
Typical Value of Turbulence Intensity	0.8%
Balances	3-component



Students research works

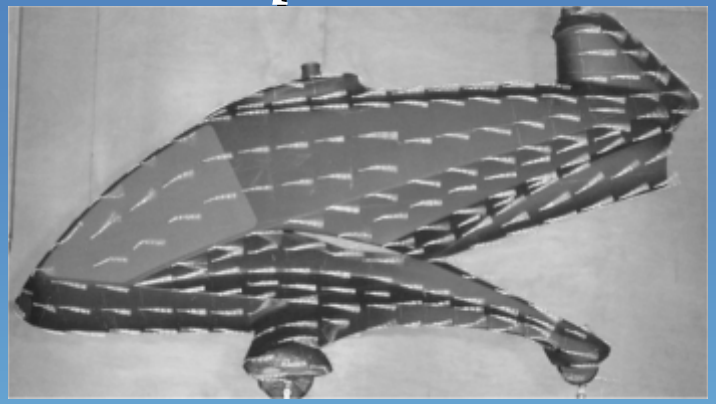
High Speed Wind Tunnel T-6

WT DESIGNATION	**T-6**
Test Section (m)	0.6x0.6 m
Length of Test Section	1.3 m
Mach Number	up to 4
Reynolds Number	up to $33x10^6$
Balances	6-component

Mach number	0.5…1.2	1.5	1.75	2.0	3.0	4.0
Run Times (s)	780…300	260	240	210	180	30

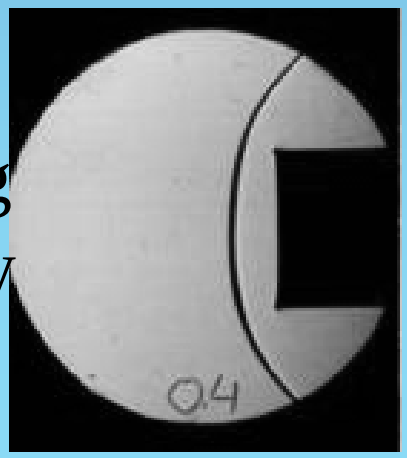
Flow visualization technique

- wool-tuft technique



- oil-soot technique

- shadowgraph imaging
- schlieren photography

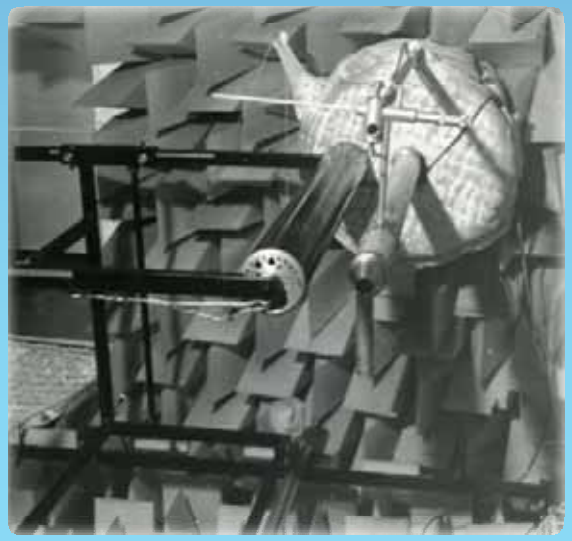


Anechoic Chamber

Dimensions (m)	3x3x4.5
Deviation of Free Acoustic Field	±1.5 dB
Octave-Frequency Band	125… 8000 Hz
Measuring Equipment	RFT

Capabilities

- analysis of air jet acoustics within far and immediate field
- noise measurement



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