Peter Magyar

Von: Adam Dąbrowski <adam.dabrowski@put.poznan.pl>
Gesendet: Mittwoch, 27. Mai 2026 18:52
Betreff: June 09, 2026 at 13:30 – second meeting of the IEEE Poland Section LMAG, "Vision in Combat Flight"

Dear Ladies and Gentlemen, Dear Colleagues,

I am pleased to invite you to participate in the next (the second in this year) meeting of our IEEE Poland Section LMAG on June 09, 2026 at 13:30.

I would like to inform you that the lecture entitled: "Vision in Combat Flight" will be presented by Professor Dr. hab. inż. Jan Ober, professor emeritus at the Institute of Biocybernetics and Biomedical Engineering, Polish Academy of Sciences.

The meeting will be organized in a hybrid form.

On one hand, the link to the meeting for the remote participants remains as usual:

https://emeeting.put.poznan.pl/eMeeting/ada-zkq-942

On the other hand, for those who will participate in this meeting physically, the address is:

POZNAŃ UNIVERSITY OF TECHNOLOGY

CENTER FOR MECHATRONICS, BIOMECHANICS, AND NANOENGINEERING

ul. Jana Pawła II 24, 60-965 Poznań

room 230 (seminar room of the DIVISION OF SIGNAL PROCESSING AND ELECTRONIC SYSTEMS).

I am kindly asking those planning to attend this meeting in person to notify this to Ms. Monika Minc <monika.minc@put.poznan.pl> by June 8, 2026.

Best regards

Adam Dąbrowski, Chairman of the IEEE Poland Section LMAG

PS.:

Ponadto proszę Szanowne Koleżanki i Kolegów o propozycje tematów, terminów i miejsc naszych kolejnych spotkań.

Topics to presented on June 9th, 2026:

The effect of high G+ on the brain and vision.
The interaction between reduced cerebral blood supply and retinal oxygenation.
Systolic blood pressure at the head, falling below intraocular pressure of 18 mm Hg.

The "gray out" and "black out" states, as a physiological WARNING of approaching the loss of consciousness.
High maneuverability of aircraft and alternating acceleration in (+/-) G conditions.
The "push-pull" effect, as the case of even a low +G, when a negative -G immediately occurs or changes acceleration in the opposite direction.
The still functioning brain lacks time to notice reduced retinal oxygenation (no response to light stimulation) at a minimal level of blood supply (at least 10 mm Hg systolic pressure above diastolic pressure).
The missed opportunity to notice the physiological LOC Warning.
Dynamics of loss of consciousness and the recovery process.

Delayed attribution of meaning to the acquired context of the situation.
Instead of updating the flight model based on flight instruments, pilots tend to replace it with erroneous pre-LOC data or erroneous expectations.
Lack of awareness of being in LOC, loss of sense of time.
Vestibulo-oculomotor responses (VOR) are useful during ground operations.
They ensure the stability of the image projection on the retina, essential for high-spatial-frequency vision, VOR moves the eyes at the same speed as the head, but in the opposite direction, compensating for head movement.
This prevents the projected image from shifting and blurring, which can impair high-resolution vision.
Analogous to taking a photo on celluloid, we must hold the camera still while releasing the shutter.
In flight conditions, the situation changes drastically.
The VOR operates in opposition to high-resolution vision, impairing it to the point, that pilots may struggle to properly read flight/navigation instruments.
Physiology explained.
VOR habituation is acquired through centrifugal training and hundreds of hours of practice in highly maneuverable aircraft.

Ototoxic chemicals (solvents) and medications, reduce or impair acquired VOR habituation.
Reduced VOR habituation can act as a trap, preventing the recognition (resolving) of spatial (3D) disorientation, even by highly trained pilots (instructors).
Pre-flight testing is necessary to assess reduced VOR habituation. The WHITE-BOX project postulates the monitoring the pilot's EYE MOVEMENTS during flight.

Professor Dr. hab. Jan Ober is emeritus professor formerly at the Institute of Biocybernetics and Biomedical Engineering, Polish Academy of Sciences.

He finished studies in 1969 at the Leningrad (St. Petersburg) Institute of Precision Mechanics and Optics. He was awarded the Doctor degree of technical sciences in 1972 at Częstochowa University of Technology, Faculty of Mechanical Engineering. He obtained habilitation in 1977 at the Department of Mechanics, Aviation, and Energy Engineering at Warsaw University of Technology.

In 1980, Professor Jan Ober established an Independent Laboratory of Rehabilitation Engineering and Biomechanics of the Institute of Biocybernetics and Biomedical Engineering of the Polish Academy of Sciences in Poznań, Poland. Throughout the period of the laboratory activity, he was acting as the Head.

Professor Jan Ober's research focuses on oculomotor functions, especially of the eyes, in the application to the diagnosis of neurological diseases, monitoring the physiological aging of the central nervous system and the risk of brain concussion in contact sports (e.g. in the case of

boxing), as well as on difficulties in acquiring reading skills among children (dyslexia). The research includes also the attention management mechanisms for operators of complex technical systems, in the safety context.

In result, this research concerns the design of systems with a built-in knowledge in such a way that the users should be aware of it. Thus, even if it is primarily a basic research that includes development of methods, diagnostic experiments, measuring devices, etc. the design of prototype devices is necessary to conduct practical tests.

He headed the White Box Project for military aviation safety and participated in European Projects: Vintec devoted to flight safety in civil aviation (shared situational awareness) and Vita devoted to safety of the energy supply European network.

It should be stressed that the devices developed by Professor Jan Ober are used in over twenty leading universities and research centers all over the world.