As part of the International Congress of Actuaries in 2018, the Scientific Committee plans to award a number of Best Paper Awards in six given subject areas. After consideration of all submissions, the Scientific Committee will decide on the number of awards and the respective cash prizes of up to EUR 1,500 for each subject area. If there are no suitable submissions, the Scientific Committee reserves the right to refrain from awarding any prizes.

Up to two Best Papers will be awarded in each of the following subject areas:

- **Big Data – Algorithms, Analysis and Application**
- **Demographic Change and Longevity**
- **Aspects of Long-Term Savings: Uncertainty in Low Real Returns, Longevity and Inflation**
- **Behavioral Aspects of Insurance Mathematics**
- **Long-Term Risk: Modelling, Measuring, Managing and Economic Valuation**
- **Mathematical Aspects of Emerging Risks**

Deadline for submissions is July 31, 2017. Further information on submission procedure and requirements will be available in due course on [http://ica2018.org/](http://ica2018.org/).
The Scientific Committee will award up to two Best Papers in the subject area

**Big Data – Algorithms, Analysis and Application.**

Nowadays, huge amounts of data are available and used in various areas of our lives. Computers in modern cars store a multitude of parameters, smart phones collect their users’ health data, weather forecasts relying on detailed data may warn property owners and genetic records may help to individualize premiums in life or health insurance. In daily life, the gathering and use of big data has become common practice when, for example, creating internet user profiles or analyzing data from retailers' store cards. In addition, insurers will increasingly be forced to use all available data in order to learn about customer needs. One can further expect that, in the future, insurers will offer risk-specific premiums to the customers by evaluating all available data.

Therefore, we strongly encourage the submission of papers related to the various aspects of Data Science.

Particular subjects of interest can be (but are not limited to):

- Claims settlement and big data
- Telematics
- Property risks especially with regard to geolocation
- Rating based on pattern recognition
- Early warning (mobile phone app)
- Connecting Big Data to actuarial problems
- Climate change and Nat-Cat
- Fraud detection
- Genetics – Impact on Life and Health Insurance
- Individualization versus collectivization
- Prediction of customer behavior

New approaches are as welcome as suitable modifications of existing and established concepts (from non-actuarial fields).
DEMOGRAPHIC CHANGE AND LONGEVITY

The Scientific Committee will award up to two Best Papers in the subject area

Demographic Change and Longevity.

Longevity is a phenomenon that is observed in most societies worldwide. While it seems desirable for individuals to live long and hopefully healthy lives, ever-increasing life expectancy is a challenge for providers of annuities and long-term care products. In combination with a decline in fertility, it leads to major demographic change with significant effects on social security systems.

We have therefore chosen longevity and demographic change as one topic for the Best Paper Awards of the ICA 2018.

Particular subjects of interest can be (but are not limited to):

- Impact from megatrends on life insurance risk: migration, urbanization, climate
- New models for predicting longevity / mortality improvements
- Demographic change and its impact on long-term care and occupational disability insurance
- Predictive modeling and price discrimination applied to annuities and long-term care products
- Designing and pricing annuities and long-term care products in a stochastic environment
- Private vs. public solutions for providing income for pensioners
- Hybrid systems for pension financing combining pay-as-you-go systems and funded systems (consequences of low interest rates and a declining number of new entrants)
- Novel techniques for mitigating longevity and long-term care risks

New approaches are as welcome as suitable modifications of existing and established concepts.
ASPECTS OF LONG-TERM SAVINGS: UNCERTAINTY IN LOW REAL RETURNS, LONGEVITY AND INFLATION

The Scientific Committee will award up to two Best Papers in the subject area:

Aspects of Long-Term Savings: Uncertainty in Low Real Returns, Longevity and Inflation

Individuals are increasingly being asked to save for retirement during their working lives and then, in their golden years, spend their accumulated assets appropriately. They do so against the backdrop of a rapidly-aging population with low fertility rates and rising longevity, as well as public pension programs that are under fiscal pressure. Moreover, funded pension systems must manage longevity risk, inflation risk and capital market risk, all of which are placing a strain on both individuals and providers of pension solutions (life insurance companies, pension funds and mutual funds). The low interest rate environment has particularly important implications for the demand for, and supply of, pension products.

We encourage the submission of papers related to all aspects of long-term saving, especially with regard to modeling uncertain inflation, longevity, and interest rates.

Particular subjects of interest could be (but are not limited to):

- The impact of inflation risk on the accumulation and decumulation of pension assets
- Dynamic portfolio choice over the life cycle amid uncertain interest rates and inflation dynamics
- Asset/liability management of pension plans over time
- The role of fixed and variable life annuities as part of a pensions program
- Implications of solvency regulation and the low interest rate environment in life and health insurance.
- Developments in life insurance product design within a changing financial and demographic world
- The role of income and investment guarantees in retirement products
- Implications of the low interest rate environment on DB, DC, and hybrid pension programs

New approaches are as welcome as suitable modifications of existing and established concepts.
BEHAVIORAL ASPECTS OF ACTUARIAL MATHEMATICS

The Scientific Committee will award up to two Best Paper(s) in the subject area

**Behavioral Aspects of Insurance Mathematics.**

Traditional actuarial models have, at best, assumed customers to behave in accordance with historic experience, if not ignoring customer behavior altogether. Only in the last 15 years has dynamic modelling of customer behavior gained importance in practical applications, most notably with the introduction of the stochastic embedded-value concepts in life insurance. However, over the last few years it has become apparent that customers do not necessarily behave in a “financially rational” manner, but that decisions such as surrender, renewal, annuity take-up or openness to cross- and up-selling are, in fact, influenced by many more factors.

Therefore, we encourage the submissions of papers that address the various aspects of customer behavior and their application to insurance.

Particular subjects of interest can be (but are not limited to):

- Global and individual drivers of customer behavior in life, general and health insurance
- Impact of changes in the social, political and financial environment on (savings) behavior (including surrender, making policies paid-up, annuity take-up, new business, renewal, reinvestment)
- Mathematical and statistical methods to describe, model and quantify customer behavior
- Allowance for customer behavior in internal models
- Applications for retention and renewal management, cross- and up-selling
- Methods and applications of customer segmentation, in particular in connection with Big Data

New approaches are as welcome as suitable modifications of existing and established concepts.
LONG-TERM RISK: MODELLING, MEASURING, MANAGING AND ECONOMIC VALUATION

The Scientific Committee will award up to two Best Papers in the subject area 

**Long-Term Risk: Modelling, Measuring, Managing and Economic Valuation.**

Insurance contracts very often contain long-term commitments, sometimes from both the insurer and the insured. Conversely, many models and concepts developed in financial and actuarial mathematics are based on assumptions that are at least questionable to prevail over a long time period.

Therefore, we strongly encourage the submission of papers that are related to all aspects of long-term risk, especially with regard to modelling, measuring, and managing those risks and their economic valuation.

Particular subjects of interest can be (but are not limited to):

- Appropriate risk and performance measurement concepts with a particular emphasis on pension investments and chance-risk classifications of pension products
- A suitable framework for the long-term decisions of an insurance company
- Long-term effects of the regulations imposed by Solvency II on the strategic behavior and the performance of an insurance company
- Interest rate modelling with a view towards a horizon of over 30 years (with possible features such as a changing environment or a prevailing low interest rate scenario)
- Estimation of the long-term behavior of forward rates or interpolation/extrapolation of the current interest rate yield curve
- Economic valuation of long-term commitments (including the valuation of different types of guarantees in insurance and pension products and the valuation for accounting purposes)

New approaches are as welcome as suitable modifications of existing and established concepts.
MATHEMATICAL ASPECTS OF EMERGING RISKS

The Scientific Committee will award up to two Best Papers in the subject area

Mathematical Aspects of Emerging Risks.

Experienced risk managers know that the reason for the next crisis will probably be a risk they cannot even imagine today. Therefore, insurers and reinsurers are increasingly aware of the need to pay attention to emerging risks, coming from changes and developments in areas such as technology, politics and climate, or implied by a situation of financial distress.

In addition to not knowing how those risks will unfold, modeling and quantifying them is a particular challenge, too. Complex interdependencies of risks, non-linear behavior and the absence of large numbers require much more than plain vanilla statistical methods. Moreover, historic data upon which to base assumptions or to fit distributions is a scarce resource. Hence, this is not a task that actuaries can solve by themselves – interdisciplinary collaboration is required to combine subject matter expertise and mathematical as well as modelling skills.

To support the industry in pursuing that important topic, we ask for the submission of papers that address the mathematical aspects of emerging risks and their application to insurance.

Particular subjects of interest can be (but are not limited to):

- Mathematical and statistical methods to describe, model and quantify emerging risks
- Applications to topics such as cyber risk, climate change, autonomous driving or aging society
- Assessment and modeling of complex interdependencies of risks
- Calibration and validation of models given sparse historic data
- Use and validation of expert judgements
- Applications of models from other industries (e.g. chemical, pharmaceuticals, nuclear science and biology) in insurance

New approaches are as welcome as suitable modifications of existing and established concepts.